The Effects of Financial Integration on the Efficiency, Profitability and Stability of the South African Banking Sector

By

JOHN-BAPTISTE MABEJANE

200830570

A theses Submitted

In fulfilment of the requirements for the degree of

Philosophiae Doctor (Ph.D)

in

Economics

at the

The College of Business and Economics

UNIVERSITY OF JOHANNESBURG

Supervisor: Prof John Weirstrass Muteba Mwamba

2021

Declaration

I hereby declare that this thesis has not been submitted in support of an application for another degree or qualification of this or any higher education institution, other than the University of Johannesburg, for any educational qualification whatsoever. I also declare that *The Effects of Financial Global Integration on the Profitability, Efficiency and Stability of the South African Banking Sector* is my own work and that all sources used or quoted have been indicated and acknowledged by means of complete references.

John-Baptiste Mabejane

February 2020

Dedication

This research is dedicated to my son, Mphuthi Letsema Mabejane and my daughter, Diphuthi Setsoto Mabejane. Be kind, be humble, and be ambitious.

Acknowledgements

I am endlessly grateful to my supervisor, Prof John Weirstrass Muteba Mwamba. I feel blessed to have had you as my supervisor, I am also thankful that you believed in me. I am also thankful to my wife Masetsoto Mabejane, my mother Christina Mabejane, my sister Gertrude Wanda and my late father Mphuthi Letsema Mabejane Senior, for the support they have given me during the period I was working on this research.

Abstract

This study empirically examines the effect of global financial integration on the profitability, efficiency, stock premia, funding and market liquidity conditions of the South African banking industry. The thesis uses a different dataset and methodology in each respective empirical chapters. The first empirical chapter looks at the effect of global financial integration on South African Banks' profitability by attempting to answer the question of whether domestic banks have competitive advantages[1] over foreign banks when it comes to bank profitability. Using the return on assets as a measure of profitability, the study employs the Generalised Method of Moment (GMM) to evaluate the impact of bank-specific, industry-specific, and macroeconomic variables on bank performance. The results show that there is no significant difference in the profitability of foreign and domestic banks operating in South Africa. Thus nullifying the home field advantage hypothesis. That is, foreign and domestic banks operating in South Africa do not affect each other's performance negatively. The second issue investigated in this thesis is the effect of global financial integration on the efficiency of the South African Banks. The thesis uses the Seemingly Unrelated Regression (SUR) method to analyse the translog of the cost function under specific restrictions. Based on monthly financial and economic data obtained from Bankscope, Quantec Easydata, and the South African Reserve Bank from 2013 to 2018 the study finds that although financial integration has increased costs in the banking industry, it has nonetheless reduced concentration in the banking market. It was also found that the level of bank efficiency in South Africa seems to follow a diminishing trend over time indicating that continued increase in the number of the banks is likely to be detrimental to the industry in the long-run. The third empirical chapter investigates the effect of financial global integration on Banks' equity risk premia in South Africa. Three versions of Capital Asset Pricing (CAPM) models were used: - the Panel data based CAPM, the global CAPM and the rolling window based CAPM. The results based on quarterly panel data on five dominant commercial banks operating in South Africa spanning 2004 to 2018; show that South African commercial banks' equity performance is synchronised to both the US and the Chinese global stock market. However, the pattern of the Chinese global market association seems to be dominating the US association. Lastly, the thesis examines the effect of global financial integration on South African Banks' funding and market liquidity conditions. Two econometric models with funding and market liquidity expressed in terms of independent variables such as exchange rate, business cycles, regulatory capital, and so on are estimated using the SUR Method. Using yearly liquidity risk data for 14 South African commercial banks from 2004 to 2018; the findings show that global financial integration, global financial crisis and market concentration do not have any significant effect on the funding liquidity of South African commercial banks. The study finds that increasing the money supply reduces the funding liquidity pressure on the industry while increasing total assets increases the level of funding liquidity risk in the industry.

Keywords: South Africa, banking sector, global financial integration, profitability, cost-efficiency, Global Capital Asset Pricing Model (G-CAPM), funding and market liquidity risk.

[1] Hereafter referred to as the home field advantage hypothesis

List of Contents

List of Tables

List of Figures

List of Appendices

CHAPTER 1

Background and Contextualisation

1.2 The conceptualisation of the study

This study looks at the effect of global financial integration on the South African banking industry. Some studies have already been undertaken looking at the effect of global financial integration or compering foreign banks and domestic banks. Most of these studies have been conducted on developed or developing countries. The South African banking industry presents an interesting field to study as they operate in a country that classified as a Newly Industrialised Country (NIC)[2].

Global financial integration is one of several legs of the broad concept of globalisation, which connect countries and their financial markets to each other. In the context of this study, global financial integration is seen as a product of foreign ownership and free movement of financial institutions between countries as well as the connection of financial markets across the globe. The establishment of blocks such as CIVETS (Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa), BRICS (Brazil, Russia, India, China and South Africa), the European Union (EU), the African Union (AU) and Southern African Development Community (SADC) serve as evidence of the forged global connectivity that enhances global partnerships and trade between countries. Other international entities that are key to the processes of the mentioned globalization and global financial integration include the World Trade Organization (WTO) and The Bank of International Settlement (BIS).

This study investigates the effect of global financial integration on the South African banking industry with a specific focus on the banking industry profitability, cost efficiency, stock performance and market liquidity conditions. Among others, these four mentioned concepts

[2] Newly Industrialised Country (NIC) is a term used to describe a country which is still classified as a developing country but is at the special advanced state of development, standing somewhere between developing and developed country

that the study intends to examine are key in determining the extent of the overall financial stability of the financial industry. This research was initiated during a period when advances in globalisation were put under extreme strain. Among others, the destructive advances include the emergence of concepts such as Brexit, Grexit and Frexit, which undermined progress already made to integrate the world. The desire to build a wall separating the United States and Mexico and the open trade tariff conflict between China and the United States were key indicators of the desire of some countries to isolate themselves, thus reversing the gains already made towards globalisation. In other events very closely related to South Africa, in 2015 South Africa initiated efforts to exit the Southern African Customs Union (SACU) while in 2016 it formally instigated discussions to pull out of the International Criminal Court (ICC) alongside countries such as Burundi and Gambia. These are just some of the international events that reflect the heightened fragility of global networks that have been formed.

Policymakers have become increasingly concerned about dramatic financial episodes taking place in the global arena. Of particular concern is the possibility of existing linkages between countries transmitting financial shocks from one economy to the other. These linkages are a product of globalisation and global financial integration. The debate, inconsistencies and contentions in the literature as to the benefits and disadvantages of financial integration for the domestic banking sector cannot be ignored and the question of whether foreign banking has brought efficiency to foreign banks remains unanswered. Indeed, the question of the benefits and disadvantages of global financial integration and globalisation at large remains inconclusive, especially for Newly Industrialised Countries (NICs), where this topic has not been adequately researched.

This study presents an empirical analysis of whether advances in global financial integration resulting from South African policy reforms have had negative or positive consequences on the South African banking industry. By keeping with the efforts of globalisation promoting institutions such as the World Trade Organization (WTO), South Africa's decision to adapt and join the global world could have also been driven by a need to benefit from improved economies of scale that could be attained from the process. The theoretical benefits that are presented by the process have been widely documented in the literature. However, further research that analyses the advantages and disadvantages of adopting global oriented national policies for African developing countries remains necessary. This study specifically looks at

the benefits and costs of global financial integration on the South African banking sector. South Africa is the only country setting in the African setting that is placed under the NIC classification.

As stated in the opening stages of the study, global financial integration facilitates world financial connectivity and promotes the possibility of contagion risk effect across countries. Also anchoring the financial globalisation process is the global payment system and the role that banks play in the international payment system. Ensuring stability in the international payment system and curbing the possibility of contagion risk in the global space through standardising bank supervision across the globe through regulation was deemed necessary. In 1930, the Bank of International Settlement (BIS) was established and mandated to ensure global financial stability from the banking front. Other entities whose roles have been key in promoting global standardization and stability include the International Accounting Standards Board (IASB) and the International Association of Insurance Supervisors (IAIS). BIS has developed a series of accords to be adopted by banks internationally. The requirements of the accords create a framework for monitoring and regulating the banks in respective countries to maintain financial stability in the financial and banking systems at a county level and ultimately at the global level. BIS introduced Basel Accord III to address the Basel II shortcomings that were identified after the 2007-2009 global financial crisis. The core philosophy of the Basel regulatory framework is dominantly grounded on the principle of capital adequacy. South Africa embarked on the implementation of the Basel III from 1 January 2013, among others, this study intends to investigate the effect of this stringent regulatory framework on the South African banking sector.

At a broader scale, this study looks at the benefits and the costs of the process of global financial integration on the South African banking sector and its indigenous/domestic banks. In the context of this study domestic banks are banks which has more than 50 percent of their ownership in the hands of South African and the foreign banks are the banks which are operating in the South African banking industry but have more than 50 percent ownership in the hands of non-South Africans entities or individuals.

Some studies partially investigate the issue of benefits and costs of global financial integration on banking industries, these include Flamini, McDonald and Schumacher (2009) using aggregated data on Sub-Saharan countries, Kosmidou, Pasiouras, Zopounidis and Doumpos

(2006) using bank data in the UK and Demirgüç-Kunt and Huizinga (1999) using panel data from aggregated developing countries. A study directly observing the bank home-field advantage hypothesis in a NIC country has not yet been adequately conducted, specifically for the case of South Africa.

This study finds that the presence of foreign banks in South Africa has not brought any notable effect on the performance of South African banks. This finding is consistent with the findings of Flamini *et al.* (2009) study conducted using sub-Saharan commercial bank data. Claessens *et al.* (2001) contradicts Kosmidou *et al.* (2006), maintains that the effect of the presence of foreign banks largely depends on the level of the development status of the hosting country. The results of this study indicate that in the case of South Africa, a country classified as a Newly Industrialised Country there is no significant difference in the performance of the foreign and domestic banks. however, the study also establishes that banks are relatively better at managing costs than domestic banks. This finding is consistent with those of Demirgüç-Kunt *et al.* (1998), Fujii *et al*. (2014); Kasman (2005) and Havrylchyk (2006).

Among others, South Africa trades with both the US and China, there two countries have a non-dying trade conflict that has recently intensified. This study finds that the South African banking industry is more connected to the Chinese economy and markets more than it is connected to the U.S market. The finding implies that South Africa has to tailor its policies to nourish the relationship it has with China. This study has also demonstrated that global financial integration and exposing the South banking industry to the global environment has enhanced ease of South African commercial banks' stocks trading.

1.2 History of South Africa in the context of globalisation

The first contact of the Southern African region with the global world came through imperialism. In 1652, Jan van Riebeeck and his fellow sailors arrived in South Africa. The Dutch thereafter created a trading post and quickly settled themselves around the shores, establishing farms. After the discovery of diamonds in South Africa, the country became subject to the colonial ambitions of most imperial states at the time. Besides the Dutch, who had already settled in the country, the British also arrived, occupying and ruling the country.

These events were followed by a series of wars between the Dutch settlers and the British Empire. In 1910, the British formed what was then referred to as the Union of South Africa while in 1934, South Africa became a state colony of the British Empire. The country only gained independence from the British Empire in 1961.

The first global trade platform involving South Africa and the Southern African region was established in 1889 between the British Cape Colony and the Orange Free State, which was then a Boer colony. This platform which was operating based on a customs union was subsequently joined by Basutoland (now known as Lesotho) and Bechuanaland (now known as Botswana), with the Natal colony also joining at a later stage.

Around the same time, another global trade platform was formed between the Transvaal Republic and Swaziland. In 1903, a much broader Southern African custom union was formed that included all the four colonies (Transvaal, Orange Free State, Natal and the Cape). Lesotho, Swaziland, southern and western Rhodesia and Botswana also formed part of this much broader platform. Further strengthening the global trade arrangement, in 1910, another custom union between members was signed, establishing a common tariff and free trade between the member entities. This arrangement was updated in 1969 when all the colonised entities had gained their independence. The relationship of South Africa with its external environment was, however, interrupted when the country was subjected to global trade sanctions because of the apartheid regime. It was only reintegrated with the rest of the world when apartheid was formally abolished with the first free, democratic elections in 1994.

Since its reintegration with the global world, South Africa has not shied away from participating in the international platform and forums. Among others, South Africa is currently a member of CIVETS and BRICS. It is a highly active member of the Southern African Development Community (SADC) and the Southern African Customs Union. It subscribes to the International Criminal Court and its banking sector is regulated by the principles of the Bank of International Settlements. South Africa is also a member of the WTO. Like the African Union, the WTO is one of the recognised bodies pioneering globalisation and has, among others, championed the signing of the Free Trade Agreement (FTA). This agreement is intended to promote global trade and openness of markets. The agreement also requires member countries to adopt policies that support international business, thus allowing foreign

entities to enter and operate in the market of countries that are not their own. The agreement further requires that the participating countries adopt policies that do not discriminate between foreign and domestic business entities operating in their environment. Other institutions that have made efforts to harness global integration include the AU. These organisations have sought to embrace integration by establishing an African Free Trade Zone. This initiative only recently came into effect in April 2019 and is intended to eliminate trade barriers between member countries. This is expected to boost trade in Africa by 60%.

1.3 An overview of the South African banking sector

The South African banking system fully subscribes to the BIS regulatory and supervision framework, through compliance, its banks have attempted to fully abide by the series of accords that BIS have instituted throughout history. The sector comprises well over R6 trillion assets, factoring a 10.5% annual contribution to the country's gross domestic product. Like many countries, South Africa operated an economic system characterised by over-regulation and repression before it adopted more liberalised financial policies, still prevalent today. Consistent with the monetary policy practised in developed economies, the South African monetary policy model is strictly focused on creating and maintaining a stable financial environment.

Despite the banking sector's volatility in the past, South Africa remains a strategic gateway to the continent with a solid democratic and legislative environment. This has resulted in a significant number of foreign banks establishing branches or representative offices in the country and others acquiring stakes in major local banks such as the Industrial and Commercial Bank of China acquiring stakes from Standard Bank and Barclays – ABSA. The South African banking sector is dominated by five banks (NEDBANK, Standard Bank, ABSA, First National Bank and Capitec. All the five mentioned banks but Capitec are globalised in terms of their operations.

Legislation, technology, products and the number of participants have changed the sector and injected high levels of competition. This is especially true for smaller banks such as Capitec Bank and African Bank, which specifically target low-income earners and the previously

unbanked market. According to the latest World Economic Forum Competitive Survey 2012/13, SA banks are rated second out of 144 countries for soundness, while the country was rated third for financial sector development. Currently, the SA banking industry consists of 17 registered banks. *Appendix 1* shows the evolution of the South African banking structure. In 2002 there were 30 registered banks, 2017 there were 34 registered banks operating in South African banks. One of the banks that has changed its ownership structure is ABSA as Barclays sold a chunk of its stake in the bank. *Appendix 2* shows the trend of performance indicated by the trend of Return on Assets. The graph shows that the banks have been fairly stable even during the period of the global financial crisis (2007- 2009). However, *Appendix 4* indicates the industry return to scales is following a declining trend.

1.4 The structure of the study

This study performs an empirical analysis of the effect of global financial integration on the South African banking system. The study looks at how global financial integration has affected the profitability of the banks, efficiency, liquidity and overall stability of the banks. The study discusses the stated concepts individually in each chapter. Apart from the present chapter, the contents of each chapter are summarised below:

Chapter 2 of this study looks at the determinant of the profitability of commercial banks in South Africa. It further looks at the effect of global financial integration on the profitability of the commercial banks operating in the industry and observes whether both foreign and domestic banks can co-exist in the same market and remain profitable. The chapter compares the ability of the foreign and the domestic banks in dealing with specific banking risks and factors that emerge from the external environment as they strive to maintain profitability. The chapter then seeks to determine whether the home field advantage hypothesis theory still holds in the face of global financial integration specific for the specific case of the South African banking industry.

Chapter 3 examines the effect of global financial integration on the cost-efficiency of the banking industry. Financial integration and the presence of foreign banks should promote liquidity in the domestic market. It should also enhance the efficiency of the interbank market

through the expansion of the market base; this is because the entrance of foreign banks increases the number of participants in the market. The connectivity of foreign banks operating in the hosting countries' market and their parent companies sitting abroad provides an opportunity for the transmission of capital from the external environment to the local banking sector, creating further market liquidity in the domestic market. The chapter also looks at the effect of competition on cost-efficiency and further tests the home field advantage hypothesis in terms of cost-efficiency.

Chapter 4 analyses the effect of financial global integration on commercial banks' equity risk premia amidst the trade rivalry between the US and China, the two countries dominating the world global trade. Because of the open rivalry between these two nations, at some stage in the future, South Africa may be forced to review its international trade policies and align itself with one of the mentioned two countries. The decisions on the policy choices have to be taken in a way that guarantees greater economic benefits to the country. The chapter considers which of the two countries is more closely linked to South Africa and which of the two transmits more shocks to South African stocks.

Chapter 5 examines the effect of global financial integration on South African banks' funding and market liquidity. The process of a global financial crisis is to a large extent a product of globalisation and its consequent elements such as international trade and global financial integration. It is the financial and trade links between countries that facilitate the transmission of liquidity shocks across the globe. The objective of this study is to investigate the effect of global financial integration and its related elements such as the already mentioned financial crisis, international business cycles, exchange rate volatilities and increased market competition that are all due to the collapse of trade barriers between countries. The chapter also investigates the effect of capital adequacy on the liquidity of the banks operating in the industry.

The overall objective of this study is to consider the effect of global financial integration on the South African banking sector. In chapter 6, conclusions and recommendations are provided. The recommendations will be useful in guiding planning and policymaking by the regulatory authorities as well as those responsible for strategic planning and decision-making for banking institutions.

CHAPTER 2

The Effect of Global Financial Integration on South African Banks' Profitability: Does the Home Field Advantage Hypothesis Prevail in South Africa?

2.1 Introduction

The effect of financial integration and financial globalisation, particularly in developing countries, remains a topical issue. The current debate in the literature on whether domestic banks are deriving any benefit from the presence of foreign banks remains a contested topic. Foreign bank ownership and foreign bank presence in domestic markets are identified as a product of financial integration. In this chapter, this study provides an empirical contribution to the ongoing debate on the pros and cons of financial integration specific in the South African banking sector. There is insufficient literature analysing on this subject, especially for NICs in Africa, as is the case with South Africa. Claessens, Demirgüç-Kunt and Huizinga (2001) claims that the ultimate effect of the presence of foreign banks on domestic banks and *vice versa* is guided by the development status of the country.

In this chapter, the study attempts to establish whether financial integration, promoted by the efforts of the WTO, has had any beneficial outcomes on the South African banking sector. Previous studies conducted on the South African banking sector such as those of Sufian and Kamarudin (2016) and Maredza (2014) are geared at analysing the determinants of bank profitability rather than the effect of the presence of foreign banks on domestic banks. Sufian and Kamarudin (2016) focuses on the effect of financial integration and financial liberalisation on bank profitability. Although these two studies recognise the importance of including an international perspective in analysing bank profitability, they do not perform a head-to-head foreign and domestic bank comparison that looks beyond just testing which category of banks is performing better nor do they provide a detailed market competition analysis of financial integration.

This study goes in-depth in its quest to establish whether there are any discriminating factors when determining the profitability of foreign and domestic banks within the South African banking sector. It also performs a home field advantage analysis by comparing the reaction of foreign and domestic banks' profitability to changes in bank-specific, industrial, regulatory and other macroeconomic factors and their comparative ability to strategise around these factors to remain profitable. To the best knowledge of the authors, this type of analysis has never been performed in an African NIC context.

Concerning banking, the home field advantage hypothesis suggests that in comparison, domestic banks stand a better chance of exploiting the opportunities that are presented by the domestic market as they are more familiar with local factors such as the culture, religion and language of the country. Domestic banks also stand a better chance of reaping the benefits presented by the state and its policies such as having state accounts in their portfolios. Domestic banks would be relatively agile in changing strategies to adapt to the continuous changes in the market as, unlike foreign banks, they are managed closely while foreign banks may have slower turnaround times as they are managed from a distance, with extended reporting structures. The global field advantage hypothesis, on the other hand, suggests that foreign banks should do better than domestic banks as they normally have stronger capital, use superior technology, have better access to international capital markets and their parent companies may assist in providing multiple risk hedging mechanisms against foreign exchange exposures when they conduct international transactions.

Dorothea and Oleksandr (2007) reports a positive relationship between foreign bank entry and domestic bank profitability and suggests that the presence of foreign banks has had beneficial consequences for the Ukrainian banking market. In contrast, Janek (2004) asserts that foreign bank entry has negatively affected domestic bank revenue in Central and Eastern Europe (CEE) countries. The study further concludes that the effect is primarily attributed to the increase in overhead costs that are associated with the presence of foreign banks. Sabi (1996) concurs, stating that foreign banks have been the most profitable in Hungary and did not improve the performance of domestic banks.

Flamini *et al.* (2009) reports unique results on the topic, the study indicates that there is no direct effect of foreign bank ownership on domestic bank earnings in Sub-Saharan countries. This viewpoint suggests that the foreign bank influx has had neither benefits nor disadvantages for domestic markets. Based on data on UK banks, Kosmidou *et al.* (2006) suggests that domestic banks dominate their foreign counterparts in their own markets because they are familiar with the market, the culture, the regulations and the language. Claessens *et al.* (2001) contradicts Kosmidou *et al.* (2006), the study maintains that the presence of foreign banks largely depends on the level of the development status of the hosting country. The study asserts that if foreign banks come from countries more developed than the hosting country, they turn to dominate domestic banks. The study further suggests that they increase the levels of competition and reduce domestic banks' profitability. This assertion is supported by Demirgüç-Kunt and Huizinga (1999) also claiming that foreign banks dominate domestic banks in developing countries. The study further affirms that the dominance of foreign banks on domestic banks does not prevail in highly industrialised countries.

Consistent with the findings of Flamini *et al.* (2009) yet contrary to Janek (2004), the results of the present study suggest that there is no association or notable effect of the presence of foreign banks on the financial performance of domestic banks in the South African context. Consistent with the findings of Sabi (1996), the results of this study also suggest that the presence of foreign banks in South Africa has not resulted in any benefits for South African domestic banks. Although the influx of foreign banks has not significantly added to banking market competition, the study at hand also indicates that the benefits of financial integration are one-sided as they are only enjoyed by foreign banks. The findings reported in this study are however in contention with results reported in the studies of Demirgüç-Kunt and Huizinga (1999) and Claessens *et al.* (2001) maintain that the presence of foreign banks leads to increased competition levels and reduced profitability of domestic banks.

No significant difference between the profitability of foreign and domestic banks operating in the South African market could be observed in this study. The results also show that there is no element of cannibalisation between foreign and domestic banks, implying that the two categories of banks can coexist in the same market. The results further suggest that there are discriminating factors which determine the profitability of foreign and domestic banks in the

South African market. This study reveals that domestic banks are able to deal with liquidity risk and credit risk, which are the core risks of the banking business. Moreover, foreign banks are not leveraging changes in the economic environment to enhance their profitability. In comparison, the domestic banks have shown themselves to be superior in their ability to anticipate changes in inflation and to restructure and adjust their asset and liability positions to stay profitable. However, domestic banks are not able to deal with changes in short-term interest rates and changes in economic growth.

This study contributes to existing literature insofar as it performs a comparative analysis of the effect of the statutory regulatory capital requirements on foreign and domestic banks. This is a topical issue as the banks in South Africa are in a transitional phase, moving away from the Basel II Accord towards adopting the newer and relatively more stringent Basel III Accord. Basel III increases the required minimum common equity tier 1 capital from 4% to 4.5%. It also requires that the minimum tier 1 capital be increased from 4% to 6%. Basel III introduces a more prudent regulatory measure in the form of the Liquidity Coverage Ratio (LCR), which aims to enhance the short-term robustness of the liquidity profiles of banks. The measure ensures that banks have sufficient stock of quality near cash assets to cover their liquidity demands for 30 calendar days. With the adoption of Basel III, South African banks are exposed to greater funding costs and are expected to hold more liquid assets which further exposes them to relatively higher opportunity costs for holding limited non-near cash assets that could otherwise be generating more revenue.

This study also contributes to the ongoing debate on the pros and cons of financial integration. Justifying the need to conduct a study of this nature is the prevailing evidence showing that countries worldwide seem to be on the verge of drifting back to operating as isolated economies, reversing the previous efforts at globalisation. Britain has pulled out of the EU, there are indications that France is reviewing its position and Barclays has indicated its intention to pull out of Barclays Africa and South Africa. The United States seems to be restructuring its foreign policy away from a globally-oriented one to more centralised policies. In 2015, South Africa threatened to withdraw from the Southern African Customs Union and in 2016 it also threatened to pull out of the International Criminal Court. These signs of a reversal of globalisation are too significant to ignore. At this stage, it is vital that the effects of

all the elements of globalisation in terms of the banking industry be analysed and understood – not only to better understand the current banking market but also to better anticipate its future. The results of this study can be used as a guide in national policymaking, planning and implementation and they can be also be used by banks in planning and profitability strategy formulation.

Apart from the noted lack of literature on foreign and domestic banks in the African context, there is a particular need to conduct this kind of study in South Africa. The country is one of the dominant international market participants, a leader and a key member in multiple international forums instituted to enhance globalisation and international trade, notably, SADC, CIVETS and BRICS. According to Nielsen (2013), South Africa falls in a unique category of development; it is the only Newly Industrialised Country (NIC) in Africa. According to the 2012/2013 World Economic Forum Competitive Survey, the South African banking industry was classified as the second-best out of 144 countries in terms of stability, safety and soundness during that period. In the same period, the country was further rated as the third-best amongst the same 144 countries, judged based on financial development. However, according to the same survey of 2015/2016, South Africa slipped in its rankings, being downgraded from third to the eighth position. According to the Banking Association of South Africa (BASA), there are currently 14 branches of foreign banks and a further 43 local bank representative offices operating in the South African banking sector (see Appendix 1). There is evidence that South Africa has abided by the stipulations and requirements of WTO's General Agreement on Trade in Services (GATS) and has allowed foreign banks to enter its domestic market.

2.2 Literature review

There is limited literature comparing foreign and domestic banks worldwide, an omission which is particularly evident in the case of African studies. Most global literature is either focused on investigating the determinants of the profitability or performance of banks without, however, establishing the differences in how banks operating in the same market are affected by different factors. Such studies include those of Azam and Siddiqui (2012), Jeon, Olivero and Wu (2011), Kosmidou *et al.* (2006) Pasiouras and Kosmidou (2007). The literature review presented below focuses on three areas: (i) the comparison of foreign and domestic banks'

profitability determinants, (ii) changes in market structure due to the influx of foreign banks and (iii) the home field advantage analysis. These three elements form the cornerstone of this study's inquiry.

Using data on 7 900 banks from 80 different countries from 1988 to 1995 and the weighted least squares as a method of analysis, the study of Claessens *et al.* (2001) demonstrates that foreign banks perform better than domestic banks in developing countries. However, this does not hold in the case of developed countries. The results of Claessens *et al*. (2001) also suggest that the presence of foreign banks has decreased the profits of domestic banks and heightened competition in the domestic market. Claessens *et al.* (2001) maintains that this impact of foreign banks can be attributed not to the *size* of the banks but the *number* of banks entering the domestic market. In general, the study claims that the global field hypothesis is likely to hold in cases where the foreign bank influx occurs in developing countries and that this influx has yielded no benefits to domestic banks in developing countries.

Lee, Hsieh and Dai (2012) examines how the presence of foreign banks affects domestic banks and whether these effects are determined by the economic and financial state of the hosting country. The study looks at 795 banks operating in 39 countries from 1999 to 2006 using the Generalised Method of Moments (GMM). The results indicate that foreign ownership is associated with a decrease in the profitability of domestic banks. The study also reveals that if the development status of the host country is low, the foreign banks will realise higher levels of profitability. Lee *et al.* (2012) concludes that the field advantage theory is to a greater extent driven by the level of development of the hosting country.

Azam and Siddiqui (2012) compares foreign and domestic banks from a sample of 36 commercial banks operating in Pakistan using the Ordinary Least Squares estimation technique for analysis. Using both ROE and ROA as proxies for profitability, the results of the study indicate that economic growth bears a positive effect on the ROA of foreign banks. However, the study finds that the ROA of private domestic banks is negatively and significantly affected by economic growth. According to the results, foreign banks are negatively affected by inflation when ROA and ROE are used as measures of performance, the effect being significant

only on foreign banks in the ROE model. In contrast to Pasiouras and Kosmidou (2007), the results further suggest that if either ROA or ROE are used as proxies, it is the foreign banks that will benefit from adhering to capital requirements. The results of this study, therefore, support the dominance of the global field advantage hypothesis.

Lensink and Naaborg (2007) analyses the effect of foreign ownership on bank performance using worldwide panel data covering 511 banks from 73 countries over the period from 1998 to 2001 using the GMM as a method of analysis. In contrast to Azam and Siddiqui (2012), the findings of the study reveal that domestic banks are more profitable and efficient in their own territories. The results suggest the dominance of the home field advantage hypothesis over the global field advantage hypothesis.

Kosmidou *et al.* (2006) investigates whether foreign and domestic banks are affected in the same way by the different profit determining factors in the UK market. The study uses multivariate regression analysis of data on 26 domestic and 32 foreign banks in the UK over the period from 1998 to 2001. The results show that domestic banks record higher returns and profits compared to foreign banks. These findings are consistent with those of Claessens *et al.* (2001) insofar as foreign banks only perform better than domestic banks in developing countries. Kosmidou *et al.* (2006) claims that the difference in how the two categories of banks perform can be attributed to differences in language, culture and regulatory structures and the fact that foreign banks are likely to be managed from a distance. The study results, therefore, suggest that the home field advantage hypothesis dominates the global field advantage in developed economies.

Pasiouras and Kosmidou (2007) investigates how foreign and domestic banks are affected by different factors in the EU. The study uses bank-level data on 15 EU countries over the period from 1995 to 2001 using the fixed effects model as a method of analysis. The results reveal that both domestic and foreign banks are positively and significantly affected by capital adequacy requirements. The study also establishes that the relationship between profitability and the size of the bank is negative for both foreign banks and domestic banks. The results further indicate that inflation and economic growth exerts a positive effect on domestic banks

and a negative effect on foreign banks. In contrast to Kosmidou *et al.* (2006), Pasiouras and Kosmidou (2007) uses data based on a broader EU scope as opposed to just looking at the UK. The results indicate that there is no evidence of the factor discrimination effect hence there is no evidence that the home field advantage dominates the global field hypothesis, *vice versa*.

Taking on a more macroeconomic perspective, Kassim and Manap (2012) investigates the macroeconomic discriminating factors affecting the performance of foreign and domestic banks. The study specifically looks at how foreign and domestic banks' deposits and loans are affected by changes in interest rates in Malaysia and how the two categories of banks strategise and respond differently to changes in interest rates. The study uses the Vector Autoregression (VAR) model, applied to bank data from 1997 to 2006. The findings reveal that changes in interest rates resulting from monetary policy decisions affect foreign and domestic banks differently. Foreign banks can anticipate and adjust their balance sheet structure effectively to stay profitable as market interest rates change. Domestic banks, on the other hand, are unable to do the same. In conclusion, the study posits that Malaysian domestic banks should learn how foreign banks strategise around the changes in interest rates to stay profitable and competitive. The results indicate that foreign banks are dominant in the Malaysian market, suggesting the predominance of the global field advantage hypothesis.

Jeon and Miller (2005) also investigates whether foreign and domestic banks were affected differently by the Asian financial crisis applying a more macroeconomic approach. The study uses Korean bank data from 1994 to 1999 and adopts the fixed effects model as a method of analysis. The results of the study reveal that Korean domestic banks were affected by the financial crisis more than foreign banks. Jeon and Miller (2005) attributes the observed finding on the reliance of foreign banks on their parent company for stronger governance, which affords them better asset and liability management strategies. They further attribute the foreign banks' resilience against the financial crisis to the fact that foreign banks' business is predominantly focused on fee-generating services rather than the provision of credit. The study rules indirectly rules in favour of the global field advantage hypothesis over the home field advantage hypothesis.

Sabi (1996) compares foreign and domestic banks in Hungary from 1992 to 1993 using the student's t-test and the Kruskal-Wallis test. The results indicate that domestic banks are

affected by credit and liquidity risk more than foreign banks in Hungary. The study claims that this is because foreign banks are not willing to take on as much risk as domestic banks. Furthermore, the foreign banks screen loan applications more rigorously than their domestic counterparts do before issuing loans. In agreement with Jeon and Miller (2005), Sabi (1996) maintains that foreign banks are the most profitable in Hungary and their presence does not improve the performance of domestic banks in the country. Sabi (1996) therefore supports the global field advantage hypothesis.

Investigating the modes of bank entry in China, Yin, Zhang, Zhang and Hu (2015) looks at 39 banks from 2002 to 2011. Like Lee *et al.* (2012), the study uses GMM as a tool of analysis. The results of the study suggest that although foreign bank entry has changed the Chinese banking market structure, it has also had a positive effect on domestic banks' ROE. The study further suggests that the presence of foreign banks in the country has made Chinese banks more competitive and has also managed to make them operationally and financially stronger and more cost-efficient. Yin *et al*. (2015) conclude that the presence of foreign banks in the country has forced domestic banks to invest in new technologies and adopt new skills, better suited to the changing market. Although this study does not compare foreign and domestic banks, it does look at whether the presence of foreign banks has had either positive or negative consequences for the hosting country's market structure, an enquiry which lies within parameters of the study at hand.

Jeon *et al.* (2011) examines the effect of foreign banks' presence on the market structure of the Asian and Latin American market. The study uses panel data regression analysis method as a tool of analysis, on a data covering the period of 1997 to 2008. Consistent with the findings of Yin *et al.* (2015) in China, the results reveal that there are negative effects on the market since the presence of foreign banks heightens the level of competition. The study further reveals that the foreign bank effect is more substantial when the foreign banks entering the market are more efficient and less credit risk-tolerant relative to domestic banks.

Another study looking at the effect of foreign banks on the market structure is that of Okuda and Rungsomboon (2007) in Thailand. The study covers the period of 1990 to 2002 and uses static panel data regression analysis as a method of analysis. In contrast to Lee *et al.* (2012), the results of the study provide evidence that a surge in foreign bank participation results in

increased overhead expenses, leading to a drop in profit margins. The study also concludes that the entry of foreign banks into the Thai market has increased the level of competition, which has created further negative pressure on the profitability of the domestic banks.

2.3 Methodology and variables used in the study

2.3.1 Dependent variable

Return on Assets (ROA): This variable not only shows profitability but it also shows how effective and efficient banks are in employing their assets to generate profitability. Rivard and Thomas (1997) indicate that ROA is the best indicator of profitability because it is stable and immune to distortion by higher equity multipliers. The indicator is also referred to as the bank's equity multiplier (Athanasoglou, Brissimis & Delis, 2008). Others studies that use ROA as an indicator for profitability include those of Ramadan, Kilani and Kaddumi (2011), Sufian (2012) and Perera, Skully and Chaudhry (2013).

2.3.2 Independent variables

2.3.2.1 Bank-specific factors

Bank Size: in this study, bank size variable is calculated as a natural logarithm of total assets. This variable provides information about the extent of the market pressure and economies of scales in the banking sector. in a case of positive returns to scale, the bigger the size of the bank, the bigger the profits the bank makes in a given year. Otherwise, a negative coefficient of the parameter implies that the banks are experiencing negative returns to scale. The purpose of the variable is to indicate whether strategic expansion could result in improved performance or not.

Liquidity Risk: in this study, the liquidity risk variable is calculated as net loans divided by total assets. Increases in net loans relative to total assets raise the liquidity risk of a bank. The effect of liquidity risk on profitability depends on the quality of the loans the bank has extended. The higher the number of quality loans, the higher the expected profits. However, in cases

where a bank has a high volume of low-quality loans, the possibility of bad debt rises and the bank may experience a negative effect on profitability in the short- to long-run.

Credit Risk: in this study, the credit risk variable is calculated as loan loss provision divided by gross loans. Jeon and Miller (2005) asserts that the volume of provision for loan losses indicates the level of risk of the banks. If a bank has effective credit management and debt collection strategy, it stands a better chance of increasing its profitability by extending more loans.

2.3.2.2 Industry-specific variables

Direct foreign and domestic bank competition effect: Return on Asset for domestic banks **(**ROA^{DOM}) is used as an independent variable in the model, determining the performance of foreign banks and the Return on Assets of foreign banks (ROA^{FOR}) used as an independent variable in a model determining the performance of domestic banks. These variables provide precise information about the effect of performance of each category of banks on one another. If the regression yields a negative and significant coefficient, this would imply that subscribing to the requirements of WTO global trade liberation policies is not doing justice to the local banks' financial performance in South Africa. The reverse is also true.

Herfindahl-Hirschman Index (HHI): This variable measures the effect of market competition on the profitability of banks. Naturally, an increase in the number of banks participating in the market should result in reduced profitability of the banks if the market is fully exhausted and the level of competition is already high. However, the nature of modern banking requires the existence of a complete and efficient interbank market. Among others, the efficiency of the interbank market depends on the number of participating banks in the industry. The entrance of foreign banks increases the base of the market and that should result in greater banking market liquidity, which in return could result in better performance. A positive HHI indicates that the banking market is more profitable when there are fewer banks in the economy; the opposite is also true, implying that the effect of direct competition of the banks on each other cannot be offset by the benefits of increased efficiency of the interbank market.

2.3.2.3 Macroeconomic variables

Inflation: This variable indicates how banks are affected by changes in inflation in the domestic market. The data for this economic indicator is obtained from Quantec. To be profitable, a bank should be able to accurately forecast and anticipate changes in inflation rates.

Economic Growth: The data for this variable is also obtained from Quantec. Banks should make high profits when economic conditions are at their best, when inflation levels are at controllable levels, when interest favours productivity and when the overall economic outlook is positive. However, the ability of banks to exploit different conditions through better anticipation allows them to perform better against their peers.

Market Interest Rate (INT): The data for this variable is sourced the Reserve Bank of South Africa. Banks should adopt forecasting models that correctly anticipate future changes in the market interest rate. Banks should therefore be able to strategically adjust their asset and liability book to take advantage of the changes in market interest rates. A positive coefficient of the parameter indicates that a bank is able to correctly anticipate changes in inflation and carry out the necessary adjustments to stay profitable.

2.4 Model Specification, Data and Estimation Strategy.

2.4.1 Model Specification

This section presents the estimation model used in the study. Among others, the estimation approach used in this study is motivated by the studies of Lensink and Naaborg (2007), Lee *et al.* (2012) and Yin *et al*. (2015). Molyneux and Thornton (1992) and Molyneux and Forbes (1995). One of the key advantages of the adopted analysis and estimation approach is that it provides information on the effect of the profitability of foreign banks compared to domestic banks and *vice versa*. The methodology also provides information about the persistence character of the profitability of the banks under observation. The primary estimation equation is presented below as equation (1).

$$I_{it} = \alpha + \beta_k X_{it} + \varepsilon_{it} \quad (1)$$

where I_{it} represents the yearly financial performance of the bank *i* indicated by either Return on Assets at period t. α is the constant term β_k representing the coefficient of bank-specific factors while ε_{it} denotes the error term. Taking the relevant industry-related factors as well as domestic and international macroeconomic factors into account, equation (1) can be written as:

$$I_{it} = \alpha + \beta_k X_{it} + \beta_z K_{it} + \beta_l M_{it} + \varepsilon_{it} \quad (2)$$

$$ROA_{i,t}^{Industry} = \alpha + \beta_0 ROA_{i,t-1}^{Industry} + \beta_2 SIZE_{i,t} + \beta_3 LIQRISK_{t,i} + \beta_4 CREDRISK_{i,t} + \beta_5 TAX_{i,t} + \beta_6 LNGDP_{i,t} + \beta_7 INF_{i,t} + \beta_8 \text{INT}_{i,t} + \mu_i + \omega_{i,t} \quad (2.1)$$

where K_{it} indicates factors that arise from outside the internal environment of the bank but are banking industry-related, β_z is the range of coefficients of the industry factors. M_{it} denotes a range of international and domestic macroeconomic factors. Equations (3) and (4) are an expansion of equation (2) where equation (3) estimates the profitability for foreign banks and equation (4) estimates profitability for domestic banks. The two equations are estimated parallel used to assess whether there is a discriminating explanatory factor effect between the foreign and the domestic banks.

$$ROA_{i,t}^{Foreign} = \alpha + \beta_0 ROA_{i,t-1}^{Foreign} + \beta_1 ROA_{i,t}^{Domestic} + \beta_2 SIZE_{i,t} + \beta_3 LIQRISK_{t,i} + \beta_4 CREDRISK_{i,t} + \beta_5 TAX_{i,t} + \beta_6 LNGDP_{i,t} + \beta_7 INF_{i,t} + \beta_8 \text{INT}_{i,t} + \mu_i + \omega_{i,t} \quad (3)$$

$$ROA_{i,t}^{Domestic} = \alpha + \beta_0 ROA_{i,t-1}^{Domestic} + \beta_1 ROA_{i,t}^{Foreign} + \beta_2 SIZE_{i,t} + \beta_3 LIQRISK_{t,i} + \beta_4 CREDRISK_{i,t} + \beta_5 TAX_{i,t} + \beta_6 LNGDP_{i,t} + \beta_7 INF_{i,t} + \beta_8 \text{INT}_{i,t} + \mu_i + \omega_{i,t} \quad (4)$$

2.4.2 Estimation Data.

In this chapter, panel data from 2011 to 2018 based on a sample of 11 South African banks classified as commercial banks by Bankscope is used. The study divided banks into foreign or domestic banks based on ownership structure. Banks with over 50% ownership by entities that are not considered South African are classified as foreign banks while those with more than 50% share ownership in the hands of South African natural residents and entities are considered South African domestic banks. Table 1 below provides the descriptions of the data and variables used in the study. It also provides information on how some key variables used in the study were calculated.

Table 1: Description of Profitability Function Model Variables

VARIABLE IN THE EQUATION	DESCRIPTION	MEASUREMENT / CALCULATION
ROA^{FOR}	Return on Assets foreign banks	(Net Income / Total Assets (foreign banks)
ROA^{DOM}	Return on Assets domestic banks	(Net Income / Total Assets (Domestic Banks)
Liquidity Risk	Measures the ability of the bank to make payments on demand	Net Loans / Total Assets
Credit Risk	Measures the ability of the bank to recover capital and make returns out of the amounts extended as loans	Loans Loss Provisions / Gross Loans
Size	Bank Size	Total Assets
INF	Inflation	South Africa CPI
LNGDP	Economic Growth	SA GDP Growth
HHIdep	Herfindahl-Hirschman Index (Deposits)	$HHI = S_1^2 + S_2^2 + \ldots\ldots S_n^2$ Where S_n = the industry deposits market share percentage of each bank included in the sample.
Ownership	A dummy variable taking a value of 1 for domestic banks and 0 for foreign banks	Banks with more than 50 percent ownership in the hands of South Africans are classified as domestic banks. Banks with more than 50 percent ownership in the hands of non-South Africans are classified as foreign banks.
TAX	Tax Expenses	Tax Expenses
Market Rates	Market Interest Rates	Money Market Rate

2.4.3 Estimation strategy

This study estimates three models using the GMM. Model 1, model 2 and model 3 estimate the financial performance of the overall South African banking industry, the foreign and the domestic banks respectively, using ROA as the indicator of profitability. This study compares the profit persistence between foreign banks and domestic banks. It also compares which category of the banks has a quicker reversion to the mean. Accepting persistence character in profits presents an opportunity to use a dynamic model. Having a lagged dependent variable as one of the regressands presents possible endogeneity and heterogeneity problems. These two problems mean that the use of Ordinary Least Squares (OLS) and Least Squares (LS) would be biased and inconsistent as their use would contravene the fundamental assumptions of regression analysis which dictates that the right-side variables should be uncorrelated with the disturbance term. The use of instrumental variable estimators such as the GMM solves the problems associated with the dynamic structure of the model as they control for unobserved heterogeneity as well as the problems associated with the persistent nature of the dependent variable. The GMM has been widely used in banking profitability studies such as those of Ben Naceur and Omran (2011), Ćurak, Poposki and Pepur (2012) and Maudos and Solís (2009) in South Africa. It has also been used in ten Middle Eastern and North African (MENA) countries as well as Macedonia and Mexico.

In the family of GMM estimators, the study adopted the Arellano-Bover / Blundell-Bond system estimator which is well-suited for samples with a shorter period. The use of a dynamic model warranted the inclusion of the lagged variable of the dependent variable as one of the independent variables. This is accommodated by the 'LAGs' variables in all the models. The adoption of a dynamic model is motivated by the fact that this study subscribes to the notion that profits have a persistent character. The Wald test is used to assess the overall goodness of fit of the models, the Arrelano-Bond AR(2) test is used to assess AR (2) in first differences while the Sargan test is used to detect test over-identifying restrictions. The study also applied Arrelano-Bond test to test for second-order serial correlation of the residuals.

The p-value of the Wald test indicates the acceptable goodness of fit in all models. The estimated coefficients are also stable, indicating that the two estimated models fit the panel

data fairly well. The Sargan test indicates no over-identifying restrictions and the Arrelano-Bond AR (2) test indicates no second-order serial correlation.

3 Empirical Results

The study presents the results of the estimated model below in table 2. The table presents 3 models. Model 1 is estimated using data based on the whole industry data, model 2 presets the result using foreign banks data while model 3 results are estimated using the domestic bank's data. As indicated in the preceding sections of this study, the method of analysis is the general methods of moments.

Table 2: Profitability Model Regression Results

ROA Dependent Variable						
Independent Variables	S.A Banking Industry Performance Model (Model 1)		Foreign Banks Performance Model (Model 2)		Domestic Banks Performance Model (Model 3)	
	Coefficient	**Std. Err.**	**Coefficient**	**Std. Err.**	**Coefficient.**	**Std. Err.**
Lagged ROA	0.9712***	0.0975707	0.2214608**	0.1102575	1.028203***	0.1173636
ROA^{FOR}	-	-	-	-	-3.23e-10	4.88e-10
ROA^{DOM}	-	-	-6.13e-11	6.66e-10	-	-
HHIdep	0.1701*	0.0920787	-	-	-	-
Taxation	-0.005	0.0129544	-	-	-	-
Size	6.95e-11	8.06e-11	1.44e-10**	6.63e-11	1.46e-11	4.29e-11
Credit Risk | -5.27e-07	1.39e-06 | -0.0004495***	0.0000912	| 4.93e-06	0.0000824		
Liquidity Risk	0.000028	0.0001032	-0.0002233**	0.0001055	0.0000201	0.0001774
Ownership	0.00335	0.0049403	-	-	-	-
LNGDP	0.2866***	0.1039243	0.1860819	0.6027511	-0.7476768*	0.4256135
INF	-0.0937***	0.0344974	-0.0603058	0.2355842	0.3245846**	0.1635174
Market Rates			0.0040026	0.0080959	-0.0148755***	0.0052986
Constant	-3.901***	1.412973	-2.509053	8.017737	9.817858*	5.667527
	Test	P-Value	Test	Wald chi2(6	Test	Wald chi2(6
Wald test	Wald chi2(6)	0.000	Wald chi2(6)	0.00000	Wald chi2(6)	0.0000
Sargan test	chi2(25)	0.38	chi2(22)	0.4246	chi2(24)	0.8194
AR(1)	Z = -2.0317	P =0.0422	Z = -2.12	P = 0.03	Z = -1.64	P =0.10
AR(2)	Z= 1.7623	P = 0.1780	Z= 0.82	P = 0.4134	Z= 1.45	P= 0.15
No Observations	35		29		31	

*, **, *** Denotes 10%, 5% and 1% level of significance

The results in table 2 indicate that the coefficient of the one period lagged dependent variable in all the three models is positive and significant, providing evidence that the South African banking industry as a whole and the commercial banks operating in it consistently have persistent profits from one period to the next. The coefficient of the one period lagged variable of the dependent variable also provides information on the character of the South African banking market. The coefficient of the one period lagged ROA in the whole banking industry market is very close to 1, indicating that for the case of the whole market, the South African banking industry is slow to revert to its equilibrium. This suggests that the level of competition between the banks operating in the South African banking industry is very low.

The coefficient of the ownership variable is positive but insignificant. The result indicates that there is no significant difference in the financial performance of foreign and domestic banks in South Africa. However, If the positive sign reported had been significant, the implication would have been that the domestic banks are significantly more profitable than the foreign banks in the context of the South African banking industry. Equation 2 demonstrates that the level of competition between the South African domestic banks is low while model 3 demonstrates that foreign banks are relatively very competitive amongst themselves. The coefficient of the HHI variable is also positive and significant, indicating that as the level of market concentration increases, so does bank profitability. This finding indicates that as new banks either emerging from the foreign or internal environment enter the market, the banking market profitability deteriorate. This implies that the adversities of increased market competition on bank profitability resulting from an increased number of banks outweigh the benefits of a broadened and complete interbank market brought about by an increase in the number of banks participating in the industry.

The coefficient of the taxation variable is also insignificant, indicating that change on tax does not significantly affect the banks. Among others, this finding provides evidence that the banks can partially pass on their tax burden to customers, this is mostly possible where markets are less competitive. The profitability of foreign banks is used as a regressand and *vice versa* for the domestic banks' profitability model. The coefficient of both variables in both equations is negative but insignificant. The results provide evidence that the financial performance of domestic banks is

not affected by that of the foreign banks and *vice versa*. Whether foreign banks make any profit or not has no financial consequences on the performance of domestic banks, implying that foreign and domestic banks can profitably co-exist in the same market. There is no significant cannibalisation between the foreign and domestic banks operating in South Africa. This reported finding is consistent with that of Flamini *et al.* (2009) and Kim and Lee (2004), which indicate that the presence of foreign banks has no impact on domestic banks' earnings in 41 Sub-Saharan countries and Korea respectively.

The coefficient of the size variable is positive in all the three equations but it is only significant for foreign banks. This finding implies that in general, the banks operating within the South African banking industry are not able to use their size to influence their financial performance. Consistently, the same result is observable in equation 3, providing information on the behaviour of domestic banks in isolation. The coefficient of the size variable is, however, significant for foreign banks, providing evidence that, if analysed in isolation, the foreign banks can use their size effectively to ensure profitability in the market. The coefficient of the size variable also provides information on the efficiency and structure of the market. The results thus suggest that foreign banks enjoy positive economies of scales if looked at in isolation. This result is also consistent with the information provided by the lagged dependent variable, which indicates that ring-fenced, foreign banks had lower levels of competition amongst each other.

The coefficient of the credit risk variable is negative but not significant in the whole industry equation, implying that on average the South African banking industry has successfully managed to hedge credit risk over time. The same analogy could safely be extended to the domestic banks, which seemed to have a relative adequate hedge mechanism against credit risk. The foreign banks' results, however, provide unique results; the coefficient of credit risk variable is negative and significant in the foreign banks' equation. This result suggests that on average, the banks classified as foreign within the South African banking industry are failing to deal with the adversities of credit risk. Compared to their foreign counterparts and taking from the sign of the coefficient with reservations, the domestic banks have an opportunity to increase their credit exposure while also providing reserves for the same exposure to boost their financial performance. Consistent with

Demirgüç-Kunt and Huizinga (1999), these findings suggest that at higher income levels, lending activities tend to be more profitable. Sufian (2012) also suggests that banks with higher loans-to-asset ratios tend to be more profitable. The non-existent relationship between foreign banks' performance and credit risk supports the stance of Sabi (1996), which suggests that foreign banks are reluctant to extend loans in the market as they focus more on service fees as a source of revenue.

As with the Credit Risk variable, the coefficient of the Liquidity Risk variable is not significant in either the whole banking industry equation or the domestic bank model. This implies that on average, the whole South African banking industry and the domestic banks can perfectly hedge themselves against liquidity risk. Just as in the case of credit risk, the coefficient for liquidity risk is negative and significant. This suggests that compared to domestic banks, foreign banks have greater exposure to liquidity risk.

The coefficients of the GDP and Market Interest Rate variables are significant and positive for the whole market while the coefficient Inflation variable is negative and significant. The results suggest that the whole banking industry is more profitable when the economy is performing well. The coefficients of GDP, Market Rate and Inflation variables are all insignificant in model 2. The results provide evidence that foreign banks operating in South Africa are immune and well hedged against economic risk, domestic interest rate risk and domestic inflation risk. On the other hand, the coefficients of the inflation and market interest rate variables are insignificant in the foreign bank model (model 2). The results indicate that foreign banks are not able to or as a matter of strategy willing to effectively anticipate changes in inflation and interest in the market to achieve higher profitability. The results of the study indicate a negative significant relationship between the market interest rate and domestic bank performance. The results of the current study are consistent with the findings of Azam and Siddiqui (2012) and Kassim and Manap (2012) which concur that domestic banks do not benefit from either an increase or a decrease in market interest rates. In Turkey, Uğur and Erkuş (2010) also report that foreign banks have a higher interest mark-up compared to their domestic counterparts.

In model 3, the coefficients of the GDP and Market Rate variables are significant and carry a negative sign, indicating that if ring-fenced, the domestic banks' performance reacts inversely to changes in GDP and market rates. Other studies reporting a negative relationship between economic growth are those of Ramadan *et al.* (2011), Valverde and Fernandez (2007), Demirgüç-Kunt, Laeven and Levine (2004) and Tarus, Chekol and Mutwol (2012). Among others, the relationship between economic growth and bank profitability can be justified by the fact that when the economy is flourishing, the level of borrowing may decline as all the categories of borrowers may also flourishing and may mostly be able to rely on internal funding. On the other hand, when the economy is at its worst, both the institutional and household financial position deteriorates. Both categories of borrowers may find themselves forced to rely on external funding hence increased bank profitability. This is only true if the capacity to service debt facilities is not wiped-out by the deteriorating economy.

3.1 Limitations and opportunities for future research

This study is conducted using data on commercial banks that are registered as foreign banks and domestic banks in South Africa. In the analysis, this study treated Amalgamated Banks of South Africa (ABSA) as a foreign bank because of its ownership structure. Unlike the other foreign banks, ABSA is an outlier in the analysis. It has fully adapted to the market and is operating exactly like the domestic banks. However, unlike other domestic banks, because of its ownership structure, it benefits from the support of the global links in the global arena. This study compares the performance of foreign banks and domestic banks in light of profitability. The same analysis should also be done in terms of cost-efficiency as this is one of the key benefits of global financial integration for hosting countries.

3.2 Conclusions on this chapter

This chapter of the study looks at the effect of global financial integration on the profitability of the banks operating in South Africa. The chapter looks at whether the home field advantage

hypothesis holds in the context of South African banking industry by comparing the profitability characteristics of domestic and foreign banks in South Africa, which is a newly industrialised country in an African setting. The chapter looks at whether the performance of foreign and domestic banks is affected in the same way or differently by changes in economic, industrial and bank-specific factors. In this chapter, the study further scrutinises the effect of foreign and domestic banks on each other as well as the effect of extended competition due to the presence of foreign banks in the country. In general, the chapter investigates whether adhering to the requirements of the WTO's GATS has been detrimental or beneficial to South African banks.

The results of this chapter demonstrate that there is no significant difference in the profitability of foreign and domestic banks operating within the South African banking sector, thus nullifying the home field advantage hypothesis. However, the results have shown that although the domestic banks have failed to dominate the foreign banks on their own turf, at least they can compete fairly with foreign banks in terms of profitability. The foreign and domestic banks operating in the South African market do not affect each other's performance negatively. This finding leads us to conclude that conforming and subscribing to the requirements of WTO and the overall need to open the market for foreign entry has not significantly affected the local banks in South Africa. The proponents of global integration purport that financial globalisation should lead to greater liquidity in the markets. Among others, greater market liquidity is supposed to be achieved through an increase in the number of banks participating in the interbank market as global financial integration leads to the entry of foreign banks in the local market. The results of this study show that an increase in the number of banks operating in the industry leads to a decline in profitability. The findings of this study suggest that the benefits derived from the expanded base in the interbank market are outweighed by the disadvantages of increased market competition.

CHAPTER 3

The Effect of Global Financial Integration on the Efficiency of the South African Banking Industry

3.1 Introduction

This chapter analyses the effect of cost-efficiency on the South African banking industry. Cost-efficiency and profitability are different yet related concepts in business management. While cost-efficiency can lead to profitability, the reverse is not true. Cost-efficiency is critical in ensuring sustained profitability and for the creation of competitive advantage for businesses. The concept of cost-efficiency is grounded in the business strategic philosophy of being able to do more for less, which is a strategic concept technically referred to as the concept of economies of scale. Ideally, an institutional strategic combination of resources should yield the maximum possible output with the minimum possible amount of resources consumed in the process of production. In the modern era, institutional cost-efficiency has become increasingly imperative as the business landscape continuously evolves and markets shift from a localised to a more globalised state. Global integration has among others intensified market competition in economies as trade barriers between countries have continued to collapse.

The South African banking industry is well integrated with the rest of the world. In terms of banking, it hosts 7 foreign-controlled banks, 15 local branches of foreign banks and 36 approved local representative offices. The South African banking industry is well developed and compares favourably with those of developed countries. South Africa has further shown its commitment to the global arena by participating in different international platforms such as CIVETS and BRICS. The country hosts one of the largest capital markets among the emerging economies and is undoubtedly one the most developed on the African continent. Appendix 8 indicates that the level of the country's financial integration has been on the rise from the opening period of this study,

right to the closing period. The trend of the surge only saw a decline in the increase in 2015 but was followed by a quick recovery in 2016, carrying on its normal trend.

The WTO, along with other key proponents of global integration, indicate that the integration process should present significant benefits to the participating countries and their markets. The process should also provide opportunities for investment portfolio diversification, facilitate risk-sharing mechanisms and ensure that financial markets are relatively unrestricted and continue expanding. The broadening of the scope of financial markets should eliminate barriers to financing constraints and decrease the cost of capital (Colacito & Croce, 2010). Andries and Capraru (2013) maintain that global financial integration is essential for the growth of competitive, efficient and stable financial markets. Kumbhakar, Lozano-Vivas, Lovell and Hasan (2001) point out that financial deregulation, which is also one of the key elements of global financial integration, has a positive effect on both banking efficiency and bank productivity.

This chapter seeks to establish whether the process of global financial integration has yielded any added benefits in terms of cost-efficiency for the South African banking industry. The study analyses the effect of global financial integration and other factors related to globalisation such as a change in the market structure on the cost-efficiency of the commercial banks operating in the South African banking industry. The study compares cost-efficiency between foreign and domestic banks and determines economies scales of the South African banking industry in the face of financial integration.

Most bank cost-efficiency studies have been conducted in developed countries. There are studies conducted in South Africa exploring the efficiency of banks such as Ncube (2009). The study analyses the cost-efficiency of banks in the country using data on domestic banks from 2000 to 2005. Unlike the study at hand, Ncube (2009) uses data from an era well before the period of the global financial crisis. Following the global financial crisis, there was a significant shift in the banking business and operational philosophy, calling for adjustments in the overall risk management and cost strategies of banks. Moreover, Ncube (2009) study does not conduct a

comparative analysis of foreign and domestic banks nor does it investigate the effect of global financial integration on the cost-efficiency of banks. Lastly, the study of Ncube (2009) does not look at the effect of competition on the cost-efficiency of banks.

Mlambo and Ncube (2011) study also analyses the efficiency of the South African banking sector. Unlike the study of Ncube (2009), which incorporates Stochastic Frontier Analysis (SFA) in determining efficiency, Mlambo and Ncube (2011) uses Data Envelopment Analysis (DEA) only while Ncube (2009) uses both SFA and DEA. Besides employing a different estimation approach to the one used in this particular study, Mlambo and Ncube (2011) does not compare foreign and domestic banks nor does it account for the effect of financial integration on bank cost-efficiency. Okeahalam (2006) investigates the production efficiency of the South African banking industry. Besides the focus on production efficiency only, its analysis is based on a relatively narrower scope as it looks specifically at the cost-efficiency of bank branches. The study does not also consider the possible effect of global financial integration on the efficiency of banks.

Similarly to Mlambo and Ncube (2011), O'Donnell and van der Westhuizen (2002) investigates efficiency analysis of the South African banking industry, like Okeahalam (2006), the study focuses on the branch level which as mentioned is a relatively narrower scope compared to the scope of the study at hand. Erasmus and Makina (2014) also examines the efficiency of banks in South Africa using standard and alternative approaches to DEA. Although the study is conducted post the global financial crisis, like the rest of the studies mentioned above, it does not include the effect of financial integration in its analysis, it does not address the issue of economies of scale nor does it perform a cost-efficiency comparison between the foreign and domestic banks.

Mlambo and Ncube (2011) reports that on average, bank efficiency in South Africa improved between 1990 to 2008. The study concedes that the number of efficient banks had declined over time. Using a sample of 61 branches of South African banks from nine provinces, Okeahalam (2006) indicates that from 2006 to 2012, all the bank branches under investigation were operating at increasing returns to scale. The study further suggests that the branches were not sufficiently efficient and that they could have lowered their costs by increasing their output. Ncube (2009) also concludes that South African banks recorded an improvement in cost-efficiency over the period

2000 to 2005. Consistent with Mlambo and Ncube (2011) and Ncube (2009) although using sample data from different periods, Erasmus and Makina (2014) suggests that from 2006 to 2012, the majority of South African banks were DEA efficient. The study further maintains that the majority of the banks continued to be efficient post the financial crisis.

Although the study at hand uses a data set and methodology that is different to those of Okeahalam (2006), Erasmus and Makina (2014) and Mlambo and Ncube (2011), like the studies above, the present study finds that the banks operating in South Africa are cost-efficient. This study also finds that the level of efficiency has been decaying over time. This finding confirms that of Mlambo and Ncube (2011), who also suggests that between 1999 and 2008, the number of efficient banks declining, affecting the overall efficiency of the industry. This declining trend is further corroborated by Maredza and Ikhede (2013) which notes that foreign banks are more cost-efficient than domestic banks. A similar finding is reported by Fujii, Managi and Matousek (2014) and Kasman (2005) although these studies were conducted outside the South African banking industry.

3.2 Literature review

This section presents relevant literature on the topic of bank cost efficiency in developed, developing and transition countries. The literature on cost-efficiency in the South Africa banking industry has already been broadly discussed and presented in the introductory part of this study. This section focuses on comparative studies examining the efficiency of foreign and domestic banks. This is followed by literature on the effects of global financial integration and financial deregulation on bank efficiency as well as literature on the effect of the financial crisis on bank efficiency.

3.2.1 Foreign and domestic bank efficiency comparison

Fujii *et al*. (2014) investigates bank efficiency in the Indian banking sector using data from 2004 to 2011. The study uses the Weighted Russell Directional Distance (WRDD) model in its analysis. The results demonstrate that ownership structure plays an important role in determining the cost-efficiency of banks in India and that foreign banks have comparably maintained a significant degree of efficiency. Indian domestic banks, on the other hand, irrespective of whether they are state-owned or privately owned, have exhibited low levels of efficiency. These findings contradict those of Das and Ghosh (2009), who also examines the effect of financial deregulation on cost and profit efficiency in the Indian banking sector. Using non-parametric DEA and data from the period 1992 to 2004, Das and Ghosh (2009) results reveal a significant degree of cost-efficiency in the overall Indian banking sector.

Fukuyama and Matousek (2011) looks at banking efficiency in Turkey from 1991 to 2007 employing a two-stage network model as the method of analysis. The results nullify the global field advantage hypothesis insofar as the authors were unable to confirm the dominance of foreign banks over domestic banks in terms of cost-efficiency. Assaf, Matousek and Tsionas (2013) also investigates bank efficiency in Turkey using the Bayesian stochastic frontier approach and GMM on bank data for the period of 2002 to 2010. In contrast to Fukuyama and Matousek (2011), the study indicates that the domestic banks indicated a higher rate of decline in efficiency when compared to their foreign counterparts, pointing to the relative dominance of the foreign banks. The study also indicates that, on average, both foreign and domestic banks operating in Turkey during the period under study exhibited a decline in inefficiency.

Wezel (2010) investigates efficiency in Central America based on a sample of 86 banks for the period of 2002 to 2007. Adopting both the SFA and the DEA approaches, the results indicate that for the entire period of the study, the foreign banks failed to outperform the domestic banks in Central America in terms of cost-efficiency. This study provides evidence that home field advantage hypothesis holds in the case of Central American banking industry.

Another study that supports the home field advantage hypothesis is that of Burki and Niazi (2010) from Pakistan. The study investigates the performance of commercial banks post-consolidation in Pakistan using a two-stage network production technology approach, covering the period 1991 to 2000. The results indicate that although both domestic banks and foreign banks remained efficient after the period of consolidation, the domestic banks' level of efficiency is comparatively higher than that of foreign banks.

Sturm and Williams (2010) investigates the determinants of bank efficiency in Australia using parametric distance functions. The study compares efficiency across banks in the United Kingdom (UK), the United States (US) and local banks operating in Australia. The results indicate that the global field hypothesis only holds for the UK banking industry; US banks showed huge levels of inefficiency, thus failing to fully provide evidence to support the global field advantage hypothesis. Sturm and Williams (2010 findings on the US bank are consistent with those reported in the study of Greene, Murende and Nikolov (2004) who examined 273 banks in Central and Eastern Europe from 1995 to 1999. The results indicate that the banks in Central and Eastern Europe experienced high levels of efficiency during the period under investigation. However, similarly to Sturm and Williams (2010), the results do not support the general theory that foreign banks are more efficient than domestic banks as Greene et al. (2004) note that domestic banks are relatively more efficient than foreign banks.

Kasman (2005) examines banking sector efficiency in Poland and the Czech Republic for the period 1995 to 2000 using SFA. The results of the study indicate that Polish banks are more efficient than their Czech counterparts. However, upon comparing the foreign banks and the domestic banks, the results reveal that in both the Polish and Czech banking sectors, foreign banks enjoy significant levels of efficiency compared to domestic banks. The results of Kasman (2005) are further corroborated by those of Havrylchyk (2006) providing further evidence that foreign banks dominate domestic banks in terms of efficiency in Poland.

Bonin, Hasan and Wachtel (2005) examines the efficiency of banks using SFA and unbalanced data from 1996 to 2000. Their sample consisted of 225 commercial banks operating in 11 transition countries. The results indicate that foreign banks are more cost-efficient than private and state-owned banks in the countries under observation. The results of the study further suggest that privatisation is not sufficient to increase efficiency in these countries.

3.2.2 The effect of financial integration on bank efficiency

Luo, Tanna and De Vita (2016) analyses the effect of financial openness on bank efficiency. Applying the GMM and SFA, the study used cross-sectional data from 140 countries from 1999 to 2011. Although the study does not analyse the effect of financial openness on foreign and domestic banks separately, the results demonstrate that financial openness reduces bank efficiency while increasing bank risk in the countries under observation.

Demirgüç-Kunt, Levine and Min (1998) examines the impact of foreign banks influx on the efficiency of the banking industry of host countries. The study applies a multivariate logit model on data from 80 countries over the period 1988 to 1995. Contrary to the findings of Luo *et al.* (2016), the results indicate that the presence of foreign bank does not lead to the fragility of host banking systems. Instead, it reduced the chances of a host country experiencing the effects of the financial crisis. The results suggest that the presence of foreign banks enhances the efficiency of domestic banks and the banking system. The study further demonstrates that in the case of Korea, the presence of foreign banks motivated domestic banks to issue quality loans and increase productivity. Finally, the study shows that foreign banks remain more efficient than domestic banks in Korea.

Silva, Guerra, Tabak and de Castro Miranda (2016) uses unbalanced data on a sample of 92 Brazilian banks over the period 2008 to 2014. Like Luo *et al.* (2016), the study examines the effect of financial integration on the transmission of risk by looking at the direct effects of the financial

networks opened up by global financial integration. The results provide evidence that financial networks created by global integration exert a positive impact on the efficiency of banks. However, the results further indicate that these networks also pave the way for systematic risk. Lin, Doan and Doong (2016) also analyses the effect of financial integration by looking at the consequences of foreign ownership on the cost-efficiency of banks in 12 developing Asian countries. The study uses SFA on panel data over the period 2003 to 2012. The results support the findings of Silva *et al.* (2016) insofar as foreign ownership enhances the cost-efficiency of the banks.

Edirisuriya and O'Brien (2001) investigates the efficiency of Australian banks before deregulation and after deregulation. The study covers the period of 1970 to 1993 and used SFA in its analysis. The results of the study indicate that there is indeed a difference in the economies of scale for the banks because of deregulation and because the economies of scales were not exhausted by financial deregulation. This implies that financial deregulation has not caused any detrimental effects on the Australian banking industry.

In China, Lin and Zhang (2009) examines the effects of global financial integration on bank efficiency by observing the effect of ownership in a study using data from 1997 to 2004. The results reveal that the Chinese banks which were acquired internationally or which were listed during restructuring experienced no significant difference in efficiency as they changed their ownership structure. Xiaogang, Skully and Brown (2005) also investigates the efficiency of banks using data on Chinese banking industry primarily looking at the effect of deregulation on cost efficiency, allocative and technical efficiency of the banks in the country. The results of the study indicate the Chinese 1995 financial deregulation programme induced a positive effect on the overall efficiency of the banks in China. Yin, Yang and Mehran (2013) also examines the effects of financial integration on China since its entry into the WTO over the period 1999 to 2010 using SFA. The study reveals that there has been an upward trend in the efficiency of Chinese banks because of the country participating in world trade. However, Yin *et al.* (2013) notes that comparatively, a more significant effect of global financial integration is observed on the largest banks in the industry while the state-owned banks remained the least efficient by the process of global financial integration.

3.3 Econometric specification of the model and data

3.3.1 Econometric specification of the model

The analysis procedure that this study uses is based on the foundation laid down by Greene and Christensen (1976), Aigner and Lovell (1977), Meeusen and Van den Broeck (1977) and follow up extensions found in studies such as Greene (2005). This study uses the seemingly unrelated regression (SUR) estimator to analyse the cost-efficiency of the banks. The decision to use SUR over OLS is motivated by the fact that, unlike OLS, the simultaneous estimation process that the SUR estimator follows accounts for both correlations across the errors and heteroscedasticity. OLS estimation is equivalent to individually estimating each equation in the system. In estimating the system of equations using SUR, the parameters of each equation in the system are estimated taking into account the information provided by other equations, thereby offering a better estimation efficiency (Cadavez and Henningsen, 2012). Following Greene and Christensen (1976), in estimating the efficiency, a system that includes the cost function and its share functions should be estimated to achieve additional degrees of freedom and bolster the efficiency of the model and its estimated parameters.

SFA and DEA are the two dominant methods that have been extensively used in the literature on efficiency analysis. DEA is a non-parametric approach while SFA follows the stochastic approach. According to Berger and Mester (1997) and Wezel (2010), SFA is the better approach of the two for analysing efficiency because it is based on economic optimisation rather than technical optimisation. In the class of the SFA procedures such as Cobb-Douglas and CES functions, the study opts for estimation of the translog cost function. The procedure is ideal for establishing the if there are economies of scales in the South African banking industry, determining the effect of global financial integration on the cost efficiency of the industry and determining which banks are more cost-efficient between the foreign and domestic banks. While other methods have their own distinctive merits, the decision to estimate the translog function is guided by the fact that the procedure provides consistent and reasonable estimate results of input substitutions, scales and

inefficiencies (Berger and Mester, 1997). The general cost function form that the study intends to estimate is thus expressed as follows:

$$TC = f(Y_j, P_i) \quad (5)$$

where; *TC* = Total cost, *P* = Input prices and *Y* = Outputs. j and i denotes a range of outputs and prices respectively

This study also recognises that external environmental factors such as global financial integration and market conditions can be vital in explaining the level of banks' cost-efficiency. Equation (5) is thus extended as follows:

$$TC = f(Y_j, P_i, X_s) + \varepsilon \quad (6)$$

where, X_s = the bank external factors that may be influential in determining banks' cost-efficiency such as global financial integration and respective changes in market structure. s denotes a range of external factors.

Partially following on studies such as Hall and Simper (2013) and Kasman (2005), which used the traditional translog function to estimate cost-efficiency, this study adopts a three-input and three-output version of translog cost function adjusted to cater for external environmental factors to estimate cost-efficiency as follows:

$$lnTC_{it} = \alpha_0 + \sum_{j=1}^{3} \alpha_j lnY_j + \sum_{i=1}^{3} \beta_i lnP_i + \frac{1}{2}\sum_{j=1}^{3}\sum_{k=1}^{3} \sigma_{jk}\, lnY_j\ lnY_k + \frac{1}{2}\sum_{i=1}^{3}\sum_{h=1}^{3} \Upsilon_{ih} lnP_i\ lnP_h$$
$$+ \sum_{j=1}^{3}\sum_{i=1}^{3} \delta_{ji}\, lnY_j\, lnP_i\ + \Omega_{it} FD_{st}\ + \omega_i FHHIloans_{st} + \gamma HHIdep_{st} + \phi GFI_t$$
$$+\ \upsilon + \varepsilon \qquad (7)$$

Where; TC denotes the observed total cost, FD represents a dummy variable taking a value of 1 for domestic banks and 0 for foreign banks. GFI represents global financial integration, FHHI denotes Herfindahl -Hirschman Index calculated using deposits and FHHloans denotes Herfindahl -Hirschman Index calculated using loans. Like in the previous chapter, HHI for loans and deposits is calculated as $HHI = S_1^2 + S_2^2 + \ldots\ldots S_n^2$, where S_n denotes the industry deposits and loans market share percentage of each bank included in the study sample. α, β, σ, γ, δ, η, Ω, ɣ and ϕ represents the coefficients to be estimated. The term ε in the equation above represents the stochastic error term for each bank, the υ is a non-negative term indicating potential inefficiency. The study sums from 1 to 3 because the model to estimate is a 3 input (Labour, Capital and deposits), 3 output ((Loans, fees and securities) the components building the model are further presented in table 3.

This study conforms to the assumption that allocative efficiency holds in banks' production technology. It further assumes that banks embrace cost-minimising behaviour, implying non-negative input share equations monotonicity. Using Shephard's lemma, the share functions are derived from the general translog function (equation 7), producing a set of three equilibrium cost share equations for each input as follows:

$$\frac{\partial lnTC}{\partial lnP_i} = S_i = \beta_j + \sum_{h=1}^{3} \gamma_{jk}\left(\frac{lnP_h}{P_l}\right) + \sum_{i=1}^{3} \delta_{ij} lnY_i + \varepsilon_i \qquad (8)$$

Where S_i is the cost share of the jth input and ε_i is the error term specific for each of the N-1 share equations.

Although there are three (N) possible sets of equations derivable from the general translog function, following Shephard's lemma, to normalise total cost, the prices of factors of production, total cost and all prices in equation (7) are divided by the price of one factor which in this case is deposits (Mertens and Urga, 2001). The normalising process ensures that the cost frontier to be estimated is well behaved. The study estimates only N-1 equations, thus eliminating the equation for deposit. As is the case with the general translog equation (7), the factor prices of the remaining share function are also divided across by the price of deposits. Among others, the elimination of the third equation from the system of the equation to be estimated yields a non-singular system that allows estimation (Dietsch, 1993; Daglis, Robertson, Tripe and Weill, 2015)). This procedure also ensures that the symmetry and linear homogeneity in prices of factors of production's critical standard properties of a cost function are maintained. Equation (7) thus takes the following form:

$$ln\left(\frac{TC}{P_d}\right) = \alpha_0 + \sum_{j=1}^{3}\alpha_j lnY_j + \sum_{i=1}^{3}\beta_i\, ln\left(\frac{P_i}{P_d}\right) + \frac{1}{2}\sum_{j=1}^{3}\sum_{k=1}^{3}\delta_{jk}\, lnY_j lnY_k + \frac{1}{2}\sum_{i=1}^{3}\sum_{h=1}^{3}\pi_{jh} ln\left(\frac{P_i}{P_d}\right)\left(\frac{P_h}{P_d}\right) + \sum_{j=1}^{3}\sum_{i=1}^{3}\sigma_{ji} lnY_i ln\left(\frac{P_i}{P_d}\right) + +\Omega_{it} FDummy_{st} + \omega_i FHHIloans_{st} + \gamma HHIdep_{st} + \phi GFININT_t + \upsilon + \varepsilon \quad (9)$$

One of the requirements of translog estimation is that the estimated cost function must sum to 1. To ensure that this requirement holds, restrictions on the system of equations were imposed, shown below as equation 10. The intercepts of the cost-share equation must sum up to 1, the row and the column coefficients must sum up to 0. These regularity conditions and the symmetry restrictions are expressed below as follows:

$$\begin{cases} \sum_{i=1}^{3} \beta_j = 1 \\ \sum_{i=1}^{3} \mathrm{Y}_{ih} = 0 \\ \sum_{i=1}^{3} \delta_{ji} = 0 \\ \sigma_{ik} = \sigma_{ki} \\ \mathrm{Y}_{jh} = \mathrm{Y}_{hj} \end{cases} \quad (10)$$

Although the omission of one cost-share function ensures a higher degree of freedom and increased efficiency of estimates as discussed, the omission results in a loss of vital information particular to the eliminated equation. The parameter estimates of the eliminated equation are recovered in restrictions shown in equation 10 above using the SUR methodology.

3.3.1.1 Choosing bank output and inputs data

Choosing outputs and inputs and deciding on their measures presents the biggest challenge in studying bank efficiency. The literature points to production and intermediation approaches as the two basic approaches that can be used to determine the outputs and inputs in cost-efficiency estimation. According to Dietsch (1993), a production approach identifies transactions on accounts as output that is a product of the processing of loans and deposits, coupled with the use of labour and capital. He further asserts that the intermediation approach identities banks as firms that are unique insofar as they differ from any other type of firm. Banks generate different types of assets employing different types of liabilities. Consistent with the assertion of Dietsch (1993), Olson and Zoubi (2011) also maintain that the most appropriate approach to follow in determining and measuring outputs where bank cost-efficiency is involved is the intermediation approach. They further emphasise that this approach considers financial liabilities and physical factors as inputs and the various assets that are produced using the liabilities as outputs. In this study, labour, capital and deposits are chosen as inputs while loans, investments in securities and income generated from non-interest activities such as charges, fees and commissions are considered as outputs. The inputs and outputs decision made in the study is primarily based on the principles of the intermediation

approach. The information on output, inputs variable as well as other data used in the study is provided in Table 3 below:

Table 3: Definition of Variables for the Translog Function

Variable	Description
Outputs	
Y1 - Output 1	Loans
Y2 - Output 2	Total non-interest operating income (fees, charges and commissions)
Y3 - Output 3	Other earning assets (securities)
Inputs	
Labour	Number of employees
Capital	The average cost per total value of net fixed assets
Deposits	Total deposits from individuals and non-bank firms
Input Prices	
Labour (P_L)	Personnel expenditure divided by number of employees
Capital (P_K)	
Deposits (P_D)	Average interest cost per total value of deposits
TC –Total cost	Interest expense + commission expense + fee expense + trading expense + personnel expenses + other admin. Expenses + other operating expenses)
FININT (Measuring financial integration)	Net foreign asset divided by gross domestic product
FDUMMY	A dummy variable taking a value of 1 during a period of financial crisis and 0 otherwise
HHIDEP	Herfindahl-Hirschman Index calculated on deposits
HHILOANS	Herfindahl-Hirschman Index calculated on loans

3.4 Calculating economies of scale

The Elasticity of Scale (ESC) indicates how the amount of output would change as the number of inputs proportionally increases. It looks at the scale of production for a single product type. The constant return to scale implies that as inputs are increased, the output will increase by the same amount. Economies of scale imply that increasing inputs result in increased output volume and a reduction in average costs arising from the increased total output, resulting in lower per-unit cost. On the other hand, diseconomies of scale imply that increasing output results in increased marginal costs that could be due to the inability to derive economic value from the increased number of inputs, thus resulting in inefficiency. Inefficiency could be due to overcrowding, resource management inefficiency or even missing the optimal level of a combination of inputs engaged in the production technology. If the value of calculated economies of scale is less than 1 (economies of scale), the banks are operating below their optimal resource combination level. Increasing the level of output for such banks would help to reduce costs. If the calculated economies of scale are greater than 1 (diseconomies of scale), it follows that the banks are operating above their optimal point. Such banks could reduce their output levels to achieve an optimal combination of resources. In measuring the economics of scale, the study uses equation (11) indicated below, which is derived from equation (5). The study calculates returns to scale from the measure of global elasticity of scale along the expansion path presented in equation (12) as follows:

$$Economies\ of\ scale\ (ECY) = \sum_{i=1}^{n} \frac{\partial TC}{\partial Y_i} \tag{11}$$

$$Returns\ to\ Scale\ (RTS) = \frac{1}{ECY} \tag{12}$$

where if:

$$(RTS)\begin{cases} > 1, implies\ economies\ of\ scale \\ = 1, implies\ constant\ returns\ to\ scales \\ < 1, implies\ diseconomies\ of\ scale \end{cases}$$

3.5 Empirical results

All the financial data used in this study is obtained from Bankscope, economic data is sourced from the Reserve Bank of South Africa and Quantec Easydata. The data spans the period 2013 to 2018. The estimation analysis of this study is purely based on the banks that were strictly classified as commercial banks by Bankscope, thus excluding banking institutions such as mutual and investment banks. This study used ownership as the criterion for deciding whether the banks could be classified as either foreign or domestic. The banks which had more than 50% of their ownership in foreign investors' possession were classified as foreign and those which had more than 50% ownership in South African hands were classified as domestic.

After dropping the deposit share equation and normalising the translog cost function, the study estimates the two share equations indicated as equation 8 and the cost function indicated as equation 9 as a system of equations. The system of equation is estimated using the iterative seemingly unrelated regression (SUR) technique with necessary restrictions for symmetry and homogeneity imposed on the parameters, as indicated in ***equations 10***. Table 4 below provides the results of the frontier and the two share equations; the standard errors indicated in the results are computed as White's heteroscedasticity corrected standard errors.

Table 4: Seemingly Unrelated Regression (SUR) Estimation Results

Variables	Coeff.	Std. Err	Variables	Coeff.	Std. Err	Variables	Coeff.	Std. Err
Total Cost Frontier Equation						Labour Share Factor Equation		
ln_pl	0.3055***	0.0974	lny2_lny3	-0.111*	0.0831			
ln_pk	0.3125***	0.1079	lny3_lny3	0.1487	0.2188	ln_pl	0.0270*	0.0158
ln_pd	0.3820**	0.1700	lny1_lnpl	-0.0544***	0.0179	ln_pk	-0.0206	0.0147
ln_y1	1.7693**	0.7657	lny2_lnpl	-0.0241***	0.0089	ln_y1	-0.0544***	0.0179
ln_y2	-0.8523**	0.4086	lny3_lnpl	0.0817***	0.0148	ln_y2	-0.0241***	0.0099
ln_y3	-0.5258	0.8557	lny1_lnpk	-0.1546***	0.0270	ln_y3	0.0818***	0.0149
lnpl_lnpl	0.0270*	0.0158	lny2_lnpk	-0.0379	0.0143	**Constant**	0.3055***	0.0974
lnpl_lnpk	-0.0206	0.0147	lny3_lnpk	0.1513***	0.0231	Capital Share Factor Equation		
lnpl_lnpd	-0.0064	0.0204	lny1_lnpd	0.2090***	0.0317	ln_pl	0.1067***	0.0130
lnpk_lnpk	0.1067***	0.0130	lny2_lnpd	0.0279*	0.0160	ln_pk	-0.0206	0.0147
lnpk_lnpd	-0.0861***	0.0180	lny3_lnpd	-0.2331***	0.0261	ln_y1	0.1546***	0.0270
lnpd_lnpd	0.0412	0.0294	FDUMMY	0.1178***	0.0377	ln_y2	-0.0038	0.0143
lny1_lny1	-0.1754	0.2512	FININT	0.0046***	0.0017	ln_y3	0.1513***	0.02306
lny1_lny2	0.1038	0.0986	HHIloans	-5.3941***	1.9207	**Constant**	0.3125***	0.1079
lny1_lny3	0.0144	0.2350	HHIdep	1.2991	0.8763	**Frontier Eqn R^2**		**0.9955**
lny2_lny2	0.0781	0.0742	**Constant**	0.6641	2.2735	**Labour Share Eqn R^2**		**0.4564**
						Capital Share Eqn R^2		**0.3208**

*, **, *** denotes 10%, 5% and 1% level of significance respectively

The coefficient of the global financial integration variable is positive and significant. The results provide evidence that the more globally integrated South Africa becomes, the higher the costs of the banks operating in the industry will be. The foreign and domestic bank dummy variable is also positive and significant. This particular finding implies that foreign banks are relatively better at managing costs than domestic banks. This finding is consistent with those of Demirgüç-Kunt *et al.* (1998), Fujii *et al*. (2014); Kasman (2005) and Havrylchyk (2006).

Banking industry market competition is measured through the HHI index using both loans and deposits. This is because the banks compete for both deposits and for the provision of loans. A high HHI index indicates a monopolistic market structure whereas a low HHI index indicates a competitive market structure. The HHI variable calculated on loans indicates the effect of competition in the selling market while HHI calculated on deposit (HHIloans) indicates the effect of competition in the factors of production market. The HHIloan variable carries a negative and significant sign, the relationship indicates that as the number of banks participating in the market increases and the banking market becomes more competitive, the costs of banks operating in the market decline. Unlike other types of businesses, banks operationally rely on each other. An increase in the number of banks operating in the industry promotes efficiency and completeness of the interbank.

The HHIdep variable carries a positive and insignificant sign, indicating that when the number of banks increases and the market becomes less concentrated, the costs will also drop. Other studies supporting this finding include those of Lin *et al.* (2016) and Silva *et al.* (2016).

Table 5: Returns to Scale [3]

Variable	Obs	Mean	Std. Dev.	Min	Max
Returns to scale	54	1.6355	0.4115	1.1584	2.7317

[3] Returns to Scale (RTS) are calculated from global elasticity of scale equation (6)

Table 5 above provides information about Returns to Scale (RTS) calculated from the estimated results estimated based on equations 11 and 12. The overall industry RTS mean is 1.64. When the markets are more competitive, this value becomes bigger; when the markets are monopolistic, the value goes below 1. The results indicate that on average, the banks operating in the South African banking industry are efficient. The Bank of Athens, Grindrod Bank, Mercantile Bank, HBZ and Sasfin Bank enjoy the highest returns to scale in the industry (Appendices 2 and 3). The four biggest domestic banks operating in the country are Nedbank, FNB, Capitec and Standard Bank. Of these, Nedbank is the most efficient.

As shown in ***Appendix 3***, the overall South African banking industry RTS follows a declining trend. The finding is consistent with those of Mlambo and Ncube (2011), who maintain that the number of efficient banks in the industry followed a declining trend between 1999 and 2008. This trend has been sustained into the succeeding period. Despite the identified overall decline in efficiency, four of the big banks operating in the country (ABSA, Standard Bank, First National Bank and Nedbank) show a consistently stable and almost identical trend of efficiency (see ***Appendix 2***). The majority of foreign banks included in the study showed declining RTS towards the end of the study. ABSA, First National Bank and Grindrod are the only banks that show a slight improvement in efficiency towards the end of the study period.

3.6 Opportunities for further research

Over the years, commercial banking business operations have been drastically transformed, shifting away from a traditional function of simply taking deposits and providing loans to customers. Commercial bank evolution stems from the concept of 'bancassurance' or allowing commercial banks to step out of their traditional role to sell insurance and life assurance products. By default, selling insurance products by banks makes insurance products part of the production output. This suggests that in estimating commercial banks' cost-efficiency, subject to the availability of reliable data, insurance and life assurance products should be afforded consideration. Due to a lack of data, however, this particular investigation is restricted to commercial banks performing roles of taking deposits, providing loans, facilitating transactions and performing treasury-based functions such as investing in financial securities.

3.7 Opportunities for further research.

This study pursues to evaluate the efficiency of the commercial banks operating in the South African banking industry. The study also compares the efficiency of foreign and domestic banks. There is a need to investigate how the comparative efficiency of the two categories of banks have changed over time, thus analysing the trend of efficiency. The primary goal should be to uncover the periods that have been critical in determining the efficiency of the commercial respective of their classification.

3.8 Conclusions on this chapter

This chapter examined the effect of global financial integration on the efficiency of the South African banking industry. The chapter established which category of banks are comparatively more efficient between the foreign and the domestic banks. It further determined whether economies of scale still exist amidst the process of global financial integration, which facilitates entry of foreign banks into the industry.

As global financial integration is inevitable, policymakers must remain informed about the broader impact of the policy decisions they make. Although the results of the study indicate that financial integration has increased costs in the banking industry, it has nonetheless reduced concentration in the banking market. It is further important to note that as the country continues to allow the operations and entrance of foreign banks in the country, this is likely not going to be detrimental to the industry in the short-run as the industry still shows increasing returns to scale. This implies that irrespective of the noted negative effects of financial integration on the industry, the ultimate benefits of the process outweigh its disadvantages. It is important to note that the level of efficiency seems to follow a diminishing trend over time indicating that continued increase in the number of the banks is likely to be detrimental to the industry in the long-run.

South Africa falls in the class of countries referred to as NICs. Although in the previous chapter, no evidence is found of significant difference between the profitability of foreign and domestic banks in South Africa, this specific chapter demonstrates that foreign banks are more efficient

than their domestic counterparts. Cost-efficiency and profitability are related concepts, however, they do not mean the same thing and they can occur independently. Cost-efficiency can lead to sustained profitability but a firm can be profitable without being cost-efficient *vice versa*. The relationship between efficiency and profitability has even been found to be conflicting, other studies that have investigated the relationship between the two concepts have found a positive association while others have found a negative association between the two financial concepts (Shieh, 2012). The reported inconsistency between the findings reported in chapter 2 and 3 is thus justifiable. The overall conclusion provided by the two chapters is that although there is no significant difference in the profitability between the foreign and the domestic banks, the foreign banks are better at managing their resource costs. Better management of costs and cost efficiency can lead to sustained profitability going into the long run for foreign banks. The results of the study prove that for NICs, the foreign banks are still more efficient than the domestic banks although the stated does not hold if a comparison is made purely on the bases of profitability.

CHAPTER 4

The Effect of Financial Global Integration on Banks' Equity Risk Premia in South Africa

4.1 Introduction and background

Globalisation is characterised by far-reaching networks between countries highlighted by trade linkages. There is evidence indicating that trade between regions and countries existed in antiquity; however, the era of imperialism is one of the critical periods in the history of globalisation. At a later stage, when most colonised countries had cast off the yoke of imperialism and gained independence, there was a global call to pull down all forms of trade barriers between countries, this marked the inception of 'formal globalisation'. To ensure order, fairness, standardisation and smooth execution of trade arrangements and settlements in the global arena, it was necessary to institute mechanisms, standards and rules. The WTO was later established in 1995 to formalise, promote and oversee this complex interaction of countries on a global platform. The geographic production resources endowment disparity is a key driver necessitating international trade and global integration.

In chapter 2 and 3, the study analysed the effect of global financial integration on profitability and cost-efficiency respectively. A thorough analysis of the performance of a business requires a total overview that is not only limited to cost-efficiency and profitability. The market value of a business indicated by the value of its shares, as well as the performance of shares of the company in the market, is very important. Global financial integration facilitates mechanisms for economic agents to access markets beyond their own, by providing opportunities to these agents to either invest or raise capital in the foreign markets. The process provides opportunities for diversification of risk and provides arbitrage opportunities whenever there are pricing imbalances across the respective markets. The effect of global financial integration on the valuation and performance of stocks may not be direct, however, it is among others determined by the forged transmission channels. This allows the spread of different types of market and economic shocks from one region to another facilitated by these trade networks. Greater

financial openness between countries presents increased competitive pressure and market congestion, which directly affect the profitability of local business institutions and ultimately, the performance of the stocks of business institutions. Global financial integration also opens up direct competition pressure on the stocks as the process allows domestic investors opportunities to shift their demand from the local market to international markets while it may also extend demand for local market stocks from the domestic to the global markets. The net effect of the external and the domestic demand for domestic stocks provides the ultimate effect of the global financial integration on the stocks in domestic markets.

Among the several legs of the broad globalisation concept, this study specifically focuses on the effect of financial integration, the systematic transmission of global volatilities as well as the global financial crisis on the South African commercial banks' stocks risk premia. It looks at the relationship between the South African banks' stock performance and the US and China stock market amid the recently opened trade rivalry between the two countries. It compares the dominance of the US and the Chinese markets global effect on the South African banks' stock performance and it assesses whether there has been any possible shift in the trend of the dominance of influence either from the US to China or *vice versa*. As both China and the US are trading partners of South Africa, this study seeks to establish which is a better partner to strategically align with as the rivalry between the two global partners heightens.

According to the International Monetary Fund (IMF) estimates for 2017 and the World Bank Organization (WBO) international comparison program database global rankings, China and US are the two countries which are dominating globally in terms of Gross Domestic Product (GDP) growth, China has taken the lead recently. Although the US is dominating the world global trade, there is evidence that China is quickly closing the gap. According to the WTO report of 2016, China is the biggest global exporter and the US is the second most dominant exporter. In the same year, the US is reported to have been the world dominant global importer with China following very closely. The two countries are joined by what is referred to as the Sino-American relation, they have also been trading partners for many years.

The China-US relationship can be traced back to a period as early as 1844 when the two countries signed the Treaty of Wanghia. Among others, this treaty paved the way for trade equality between the two countries and articulated the free movement of missionaries between

the two countries. Despite subsequent treaties and agreements that were signed between the two countries over the years, there is always a glimpse of a possible rivalry looming in the background. The two countries had many issues that remained unsolved relating to state governing regimes, human rights, nuclear concerns and territorial matters, particularly in the South China Sea.

The US and China are both key South African trading partners. The trade relationship between South Africa and these two countries may be affected as the trade tension between the two superpowers heightens. Trade between South Africa and China is reported to have amounted to US$ 14 million before 1992, increasing to US$ 1.4 billion in 2010 after the relationship between the two countries was formalised (Wolvaardt, Wheeler and Scholtz, 2010). In the same year, South Africa was invited to join BRICS, further enhancing the relationship between South Africa and China. In 2015, China and South Africa signed multiple agreements valued at around US$16.5 billion.

Unlike the more recent relationship with China, South Africa's relationship with the US can be traced back to a period as early as 1799 when the consulate of the United States was established in Cape Town. The relationship between the two countries was, however, dented by the apartheid policy that South Africa adopted in 1948. In 1986, the US introduced sanctions against South Africa, most of which were trade-related. The sanctions were later lifted upon the dismantling of the political regime in 1994. In 2001, the US was the dominant South African trading partner. As with China, the two countries are also committed to promoting international trade with each other. In 2016, the volume of South African Chinese bilateral trade is reported to have been standing at R299 billion. In 2018, China emerged as a leading import and export partner to South Africa, accounting for 10.2% and 18.2% of exports and imports respectively. The US is the second leading export partner, accounting for 7.1% of the total South African exports and is the third South African import partner after Germany.

Several studies have analysed the determinants of excess returns on stocks using South African listed company data. These studies do not specifically consider the analysis of South African banks' stocks while others do not include a global perspective in their analysis. One study that

at least makes use of South African data as part of its analysis panel and applies a global perspective is that of Piesse and Hearn (2005). The study observes the transmission of returns volatility across Sub-Saharan countries. However, from a South African perspective, the results are not very helpful in aiding investors and policymakers as they provide information on a panel of Sub-Saharan countries. The problem with multi-regional studies is that they run the risk of missing the critical, unique characteristics of each panel in the analysis. Furthermore, the study did not particularly intend to observe the behaviour of the excess return on the banks' stocks.

Another study assessing the influence of global markets on South African stocks is that of Chinzara and Aziakpono (2009). Like Piesse and Hearn (2005), it focuses on South African stocks in general without placing any special emphasis on bank stocks. Hakim, Hamid and Meera (2015) investigates the behaviour of stock prices focusing on both the local and the global markets. The study uses data on BRICS countries and like Piesse and Hearn (2005), it provides aggregated results that may not be very useful in guiding the policy-making and investor decision-making process. The study is also not specifically focusing on analysing the behaviour of banks' stocks.

Boako and Alagidede (2017) also investigates the behaviour of African stock prices specifically looking at the co-movement of such stocks prices against the global market. As part of its panel data analysis, the study includes data on South African stocks. Like Piesse and Hearn (2005) and Hakim *et al.* (2015), the results do not provide any specific insights for investors interested in bank stock investment nor does it aid bank management in making financing decisions, as the results are not specific for South African case.

Chinzara (2011) examines the effect of macroeconomic conditions on the prices of stocks in South Africa. Although the study covers aspects of global financial integration, it does not address some of the key elements that this study seeks to address such as comparing the effect of spillovers from China and the US. Like the other studies mentioned here, it does not specifically focus on the commercial bank' stocks. Phiri (2017) also investigates the effect of

macroeconomic conditions on stocks but specifically focusing on the effect of inflation. Both Chinzara (2011) and Phiri (2017) do not include a global perspective in their analysis.

Although there may be common factors that drive the pattern of stock prices, different industries have unique factors determining their stock performance in the market. Among others, factors that may affect stocks differently include sentiments, the stability of industry returns, seasonality and other factors related to the financial performance of companies in the industry. This study addresses the void in the literature on studies that are specifically focusing on the behaviour of South African stocks in a global context. The results of this study indicate that excess returns on the commercial banks' stocks are globally determined. This finding is consistent with those of Hakim *et al.* (2015) and Boako and Alagidede (2016) although the results of these two studies are not derived from bank-specific data.

Like the study at hand, Chinzara and Aziakpono (2009) also find that top mong the international stock markets that have a significant influence on the South African stock market is the US and China stock markets. This study finds that the economic conditions and stock markets in China are positively associated with the South African banks' stock premia. The US economic conditions and the stock markets are found to be inversely related to the South African banks' stock risk premia. This study finds that excess returns on the South African banks' stocks dropped significantly during the financial crisis. The study also indicates that although there was a recovery in the post-financial crisis period, the excess returns never recovered to the level they were before the crisis as the coefficient is positive but not significant.

There is no study yet conducted that compares the US and the Chinese market systematic risk specific to South African commercial banks' stocks risk premia. There also is no study on the effect of the US and Chinese stock market business cycles on South African banks stock risk premia. Moreover, there is currently no research on the effect of global financial integration on the excess returns on banks' stocks. As indicated, the present study was instigated at a time when the US was showing signs of possibly sequestering its markets away from the rest of the world. The findings of this study can be used to aid informed international strategic decisions

in policymaking and implementation. They can further be used as a guiding tool by investors and in bank strategic policy formulation.

4.2 Literature review

As already indicated above, numerous studies are investigating the effect of globalisation on stock markets excess returns. These studies have, however, been conducted on either developed or emerging economies, leaving a big gap concerning developing countries, particularly in Africa. Such studies include that of Kenani, Purnomo and Maoni (2013), which investigates the degree of integration between the Chinese and Indonesian stock market. The study observes integration specifically for the period after the global financial crisis and evaluates the degree of spillovers across the two countries using the exponential generalised autoregressive conditional heteroscedasticity model. Covering the period from 2002 to 2011, the study reveals that there is a bilateral return volatility transmission effect between China and Indonesia. The study further establishes a unidirectional volatility transmission effect from Japan to Indonesia although it could not establish any volatility spillovers from the US to Indonesia. In summary, the results indicate that international investors would benefit from diversification if they invested in the US and Indonesia.

Tsai (2017) compares the global contagion risk effect of economic policy uncertainty from China, the US, Japan and Europe to the rest of the world. Using the generalised VaR framework, the study analyses 22 stocks for the period from 1995 to 2015. Partially consistent with the results of Kenani *et al.* (2013), the results indicate that of all the countries included in the panel, China is found to be the major source of volatility spillovers to other regions across the globe, even more than the US.

Donadelli (2013) investigates the effect of financial integration and openness on the stock market. This study used stock market data on 28 emerging and 7 advanced national stock markets from 1988 to 2011. The study uses a model derived from a standard capital asset pricing model, extending the model by including 'global index' as a proxy for financial integration. The results indicate that the level of openness is heterogeneous across emerging

countries. Moreover, the variation in excess returns on the stocks from emerging countries, contributed by non-traded risk factors, is dependent on the degree of market openness.

Loncan and Caldeira (2015) analyses the effect of financial integration on the cost of stock of Brazilian listed companies using the US market as a proxy for the global market. A combination of regression analysis and descriptive statistical analysis is used on a set of data ranging from 2000 to 2013. The study estimates the global capital asset pricing model using OLS. The results indicate that the Brazilian stock market is well integrated with the global stock market. The regression results also suggest that the re-evaluation effect hypothesis holds as the financial integration variable is significant and positive, especially after controlling for systematic risk.

In Turkey, Gazioglu (2008) uses quarterly monthly data for the period 1994 to 2003 and the Structural Vector AutoRegressive (VAR) model to investigate the impact of capital inflows and outflows to the country's real exchange and real market returns. The study also sought to establish the channels through which inflow of capital affects the price of stocks. The results reveal that the long-run effect of capital inflows in Turkey is transmitted through appreciation of foreign exchange followed by a decline in the stock price. These results are further confirmed in the study of Bardhan, Edelstein and Tsang (2008).

Doman and Doman (2013) investigates the impact of globalisation and the financial crisis on the trends of linkages between national stocks using 16 pairs of stock market indices. Among others, the study analyses the dependencies of these stocks on the FTSE and S&P 500 from 1995 to 2009. The study uses a combination of dynamic copula models and sequential testing procedures centred on the model confidence set methodology. The results indicate that the level of dependencies on stocks has increased over time and this increase is attributed to the effects of globalisation. The results nullify the notion that the dependencies between stocks are relatively stronger during the periods of the financial crisis.

Jinjarak (2014) examines the role of financial integration and economic shocks on stock excess. The study uses the VAR model using US monthly data from 1989 to 2006. The results of the study indicate that global economic shocks are associated with excess returns of stock prices. The study further finds that trade-related integration perpetuates the association between the stocks and the international conditions and markets. The results reveal that the impact of global economic conditions is transmitted to the current returns of stock prices. The findings are consistent with Donadelli (2013) as they emphasise the importance of openness in influencing stock markets. The results further establish that Federal Reserve funds are negatively linked to international stock returns.

Jinjarak (2014), Brana and Prat (2016) examine the role of economic effects on the global stock market network. The study looks at the effect of global excess market liquidity on the stock markets. The study recognises market liquidity as closely related to the monetary policy and macroeconomic concepts, the study further associates the two concepts to the business cycles. Using a panel threshold model on quarterly data from 1995 to 2011, the results indicate that global excess liquidity has a positive effect on the stock return in emerging economies. During periods of financial distress, return on the stocks in these countries also declines.

Morana (2008) probes the role of economic and financial integration on stock market co-movements. The study uses the macroeconomic based factor vector autoregressive framework (F-VAR) on a quarterly times series for G7 countries such as the US, Canada, the UK, Japan and Europe from 1980 to 2005. The study distinguishes the effects that are economic and financial. In general, the results suggest that both financial and economic integration makes a significant contribution to the determination of the international stock markets co-movement. The study further finds that economic integration affects stock markets through global economic shocks.

Bardhan *et al*. (2008) estimates a global capital asset pricing model to investigate the effect of financial integration on real estate returns. The study uses annual data for 946 firms from 16 countries, covering the period from 1995 to 2002. The model accounted for the effects of financial integration, global markets and macroeconomic conditions. The results indicate that

the excess returns on stocks in the individual countries are in general, negatively related to financial openness. The findings also indicate that national returns over risk-free rates and forces of demand and supply are key in determining excess returns.

Other studies on African stock markets include that of Boako and Alagidede (2016). This study sought to determine whether financial market convergence exists in the context of African markets and examined the balance between local and global convergence the African markets. The study uses daily data from 2003 to 2014 and the Augmented Dickey-Fuller and Kwiatkowski-Phillips-Schmidt-Shin unit root tests as tools to measure for stock convergence. The results reveal that African markets indicate only a limited deterministic convergence and this is the case for both global and regional observations. The results further suggest that international investors can still derive value from investing in African securities in pursuit of diversification.

Hakim *et al.* (2015) estimates a multi-factor capital asset pricing model, extending the model developed by Sharpe (1964) by adding a global market portfolio using GMM. The study uses monthly data from 2004 to 2013 on listed non-financial firms. The study estimates the model on three BRICS countries, namely, China, India and South Africa. The results indicate that the Chinese market shows characteristics of a fully segmented market while the South African market shows signs of a partially integrated market where both the global and local market seems to determine the returns on stocks. The results of Hakim *et al* (2015) are partially consistent with the findings of Tsai (2017) as they both indicate that China is the global transmitter of stock market volatilities, and not a recipient.

As the world integrated and trade restrictions collapsed, it became possible for domestic investors to take up trade positions on foreign securities and for foreign investors to access local markets. It has further become easy for multinational companies to establish businesses in foreign markets through either acquisition or starting up new business ventures. Among others, these two elements led to a possible synchronisation of markets, hence the need to consider a Capital Asset Pricing Model (CAPM) with a global perspective. Studies that

pioneers global or international CAPM include those of Solnik (1974), Stulz (1984) and much later, Donadelli (2013), Jinjarak (2014), Bentes (2015), Hakim *et al.* (2015) and Tsai (2017).

4.3 Model specification, data and variables

4.3.1 Model specification

This chapter of the study is focused on analysing the determinants of the risk premia of the South African commercial banks' stocks within a scope of a perfectly globalised environment. The chapter investigates how banks' stock performance is affected by changes in conditions in the markets of global trade leading countries. As indicated in the literature review part of the chapter, studies have been conducted examining the behaviour of stock risk premia using different models. There are several models and respective follow-up versions used to analyse the performance of stocks. A traditional model used to estimate the performance of stocks is the Capital Asset Pricing Model (CAPM) developed by William Sharpe (1964), Jack Treynor (1962) and John Lintner (1965a,b) and Jan Mossin (1996), (Perold, 2004). Other follow-up models were introduced in the studies such as Merton (1973), Ross (1976), Banz (1981) and much later Fama and French (1993).

To observe the effect of the international markets on the South African banks' stock premia and to understand nature of the relationship between bank stocks and the origin of vulnerability explained by systemic shocks, the study investigates and compares the influence of China and the US markets on South African bank stocks. As already stated, China and the US are currently dominating the world trade and are continuously in conflict. In this chapter, the study estimates an extended version of the CAPM developed by Sharpe in 1964. The amendments adopted on the model are further discussed from equation 15 to 17 below. The original version of the model of Sharpe (1964) considers the asset's sensitivity as well as the systematic risk, it considers the stock risk premia as a function of the risk-free rate and the market excess return. The model is grounded on the principle that investors should obtain returns higher than that provided by what is considered as a free risk security to compensate them for taking on additional risk by investing into a relatively more risky asset. The original model takes the following form:

$$R_{i,t} - rfr_t = \alpha + \beta M_t + \varepsilon \quad (13)$$

$R_{i,t} - rfr_t$ = Risk premia

Where; $R_{i,t}$ denotes observed stock return at time t, rfr_t denotes the risk-free rate at time t, M_t represents the market return at time t and ε is the stochastic error term. The α (alpha) represents the return on risk-free security, the β (beta) provides information on the relationship between the observed stock and the market. Subscript *t* and *i* represents time range and the number of banks whose stocks have been included in the panel respectively.

A positive beta indicates that the stock is moving together with the market while a negative beta indicates an inverse relationship between the stock and the market. When the beta is lower than 1, this indicates that the stock has a lower risk than the market portfolio; when the beta is greater than 1, this indicates that the stock is riskier than the market portfolio. Beta is also identified as a measure of systematic risk; it indicates whether a stock provides any diversification opportunities.

In a perfectly globalised financial landscape, the individualised attributes of the local markets become relatively insignificant while the global market characteristics become dominant. This phenomenon allows interactions of the markets at a global scope, leading to synchronisation of markets and the spread of the contagion effect between stocks in the global arena. It is because of this contagion effect that the segmented form of the CAPM must be transformed, hence it is necessary to consider the more global form of the CAPM. *Inter alia,* the effect of integration on stocks is brought about by the role of investors who seek to hold the globally invested portfolio and the ownership structures of companies, as some are either international or multinational companies. The functional form of global CAPM adopted in this study is structured as follows:

$$Rsa_{i,t} - rfrsa_t = \alpha + \beta_{china}(RetchinaMarket_t - rfrch_t) + \beta_{US}(RetUSmarket_t - rfrUS_t) + \delta FI_t + \lambda fincris_t + \eta LnGDPch_t + \psi lnGDPus_t + \varepsilon \quad (14)$$

Where; α denotes a constant, $\delta, \lambda, \eta, and\ \psi$ are parameters for global financial integration, a dummy for the financial crisis period, the Chinese business cycle and the US business cycle respectively. β_{china} and β_{US} represent the market betas for China and the US respectively, $Rsa_{i,t}$ represents the realised returns for publicly traded South African commercial bank stocks for bank i, at time t, $rfrsa_t$ is the risk-free rate in South Africa at time t, $RetchinaMarket_t$ denotes the returns on the Chinese stock market. $rfrch_t$ denotes the risk-free rate on the Chinese market at time t, $RetUSmarket_t$ denotes returns on US stock returns at time t. $rfrUS_t$ indicates the risk-free rate in the US, FI denotes financial integration at time t, $LnDGPch_t$ represents a change in China's GDP at time t. $lnGDPus$ Denotes a change in the US's GDP at time t, $RetchinaMarket_t - rfrch_t$ denotes Chinese market risk premia, $RetUSmarket_t - rfrUS_t$ denotes US market risk premia *and* ε is the error term. Subscript *t* and *i* represents time range and the number of banks whose stocks have been included in the panel respectively.

The study analysis is carried out in two stages. In the first stage, the study uses a panel regression method estimating four CAPM models. In model 1 and model 2, the study estimates global CAPM using the Chinese and US global markets. In model 3, the two international markets (The US and the China market) are included in the same equation. In model 4, all the variables of interest for this study such as global economic conditions, financial crisis and financial integration are also included in the estimation. In the second stage of analysis, the study runs a rolling window regression based on model 4 to establish the trend of the relationship between the South African banks' stock and the Chinese and the US markets.

The study also uses the Hausman test to determine the appropriateness of the application of the Fixed Effects Model (FEM) against the Random Effect Model (REM). The test compares the consistent but less efficient estimator (FE) to a more efficient estimator that is only consistent by evaluating the systematic difference in the coefficients of FEM and REM. For all the models, the study failed to reject the null hypothesis, the null hypothesis of the test is that the coefficients from the FEM and REM are not systematically different thus accepting that the coefficients of the FEM and the REM are not systematically different and that the unique errors are not correlated with the regressors. Subsequently, the Breusch and Pagan Lagrangian multiplier tests for random effects were applied to decide between REM and a simple OLS regression. The null hypothesis for the test is that the variance across panels is 0. The results

of the test lead to a failure to accept the null hypothesis also implying that the behaviour of the stocks of the banks included in the sample is not the same across the banks. Significant evidence of differences across the banks indicates that the REM is appropriate for adoption.

All four models suffered from cross-sectional dependence. To rectify this, the REM is estimated using generalized Huber/White/sandwich estimator in Stata. Estimating the REM using this procedure relaxes the assumption of independence of the panel observations, the procedure provides correct standard error irrespective of the correlation of the panel observations and heteroscedasticity.

4.3.2 The data and variables

In this chapter, the study uses quarterly panel data on five dominant commercial banks operating in South Africa spanning 2004 to 2018. Economic based data such as GDP and balance of payments for both the US and China is derived from Quantec Easydata. The Nasdaq Composite Index and the Hang Seng Index data are used as proxies for the US and Chinese stock markets. The data for these two variables is obtained from INET BFA.

Table 6: Description of Variables Used in this Chapter

Variable	**Description**	**Source**
SABankstock	Price of South African banks' stocks	INET BFA
Chbankstock	Hangseng index (a proxy for the Chinese stock market)	INET BFA
USstockprices	Nasdaq Composite Index (a proxy for the US stock market	INET BFA
lnGDPsa	Log of GDP South Africa	Easydata Quantec (IMF)
LnGDPus	Log of GDP US	Easydata Quantec (IMF)
Chrkpremia	China Bank stock riak Premia	Calculation based om equation 13
USrkpremia	US Bank stock risk premia	Calculation based om equation 13
USrate	US money market rate	Easydata Quantec (IMF)

Chrate	China money market rate	Easydata Quantec (IMF)
SAintrate	South African money market rate	Easydata Quantec (IMF)
Finint	Measures financial integration	Net foreign asset divided by gross domestic product (South African Reserve Bank database
Global Financial Crisis	A dummy variable takes a value 0 when there is no crisis and 1 during a period of the global financial crisis (2007-2009).	

4.4. Empirical findings

Table 7: Global Capital Assets Pricing Model

	Model 1		**Model 2**		**Model 3**		**Model 4**	
	Coeff.	**Std. Err.**	**Coeff.**	**Std. Err.**	**Coeff.**	**Std. Err**	**Coeff.**	**Std. Err**
Chrkpremia	0.4249625***	0.0441	-	-	0.3533***	0.0288	0.3203***	0.0391
USrkpremia	-	-	0.2483***	0.0497	0.1085**	0.0458	0.1282*	0.0678
Lngdpch	-	-	-	-	-	-	34.050***	7.2990
Lngdpus	-	-	-	-	-	-	-102.0***	8.4924
Finint	-	-	-	-	-	-	187.53	167.37
Fincris	-	-	-	-	-	-	-8.249***	0.7290
Constant	-2.888973**	1.2935	-2.7216*	1.4456	-2.8987**	1.3010	2181.54***	187.35
R2								
within	0.1244		0.0712		0.1346		0.2362	
Between	0.0807		0.0807		0.0807		0.0411	
Overall	0.1190		0.0667		0.1281		0.2230	
Wald chi2(1)	21.64		24.98		151.68		278.00	
Prob > chi2	0.0000		0.0000		0.0000		0.0000	
No Obs	308		308		308		308	

*, **, *** denotes 10%, 5% and 1% level of significance respectively

The reported correlation coefficient in all the models is relatively low. However, most of the studies that estimate CAPM, especially global ones, report low correlations coefficient. For example, Bardhan *et al.* (2008) report an adjusted R squared as low as 4%. Dolde, Giaccotto, Mishra and O'Brien (2011) report correlation coefficients as low as 14%. Solnik and Zuo (2012) report a correlation coefficient of 18%. The Wald test indicates good overall fitness of the model.

In general, the results of this study indicate that South African bank stocks are positively synchronised to both the US and Chinese stock markets as both these markets' betas are positive and significant. Although the values of both countries' betas are far from 1, the South African-Chinese market beta is higher than the South African-US market beta in all the models. This implies a relatively higher synchronisation level between the Chinese market and the South African market. The consistent progression of influence of the Chinese stock market on other markets is also noted in the study of Hakim *et al.* (2015), confirming that China is a significant global transmitter of stock market volatilities. This is corroborated by Kenani *et al.* (2013) who compared the US and Chinese degree of stock market volatility spillovers on Indonesia, also establishing that China is emitting volatilities to Indonesia while the degree of spillovers from the US has been insignificant.

The results of this study indicate that the South African bank stock market is also influenced by global economic conditions (Indicated by changes in GDP). Performance of bank stocks is negatively associated with changes in economic conditions (Indicated by changes in GDP) in the US and the relationship is significant. The results also show that the South African bank stocks performance is positively associated with economic conditions (indicated by changes in GDP) in China, and the noted relationship is also significant. The global financial crisis variable enters the model with a negative and significant sign. The results indicate that the global financial crisis negatively affected the performance of South African commercial bank stocks. The financial integration variable is insignificant, indicating that the degree of financial integration does not have any effect on the performance of bank stocks in South Africa.

4.5 The rolling window regression results

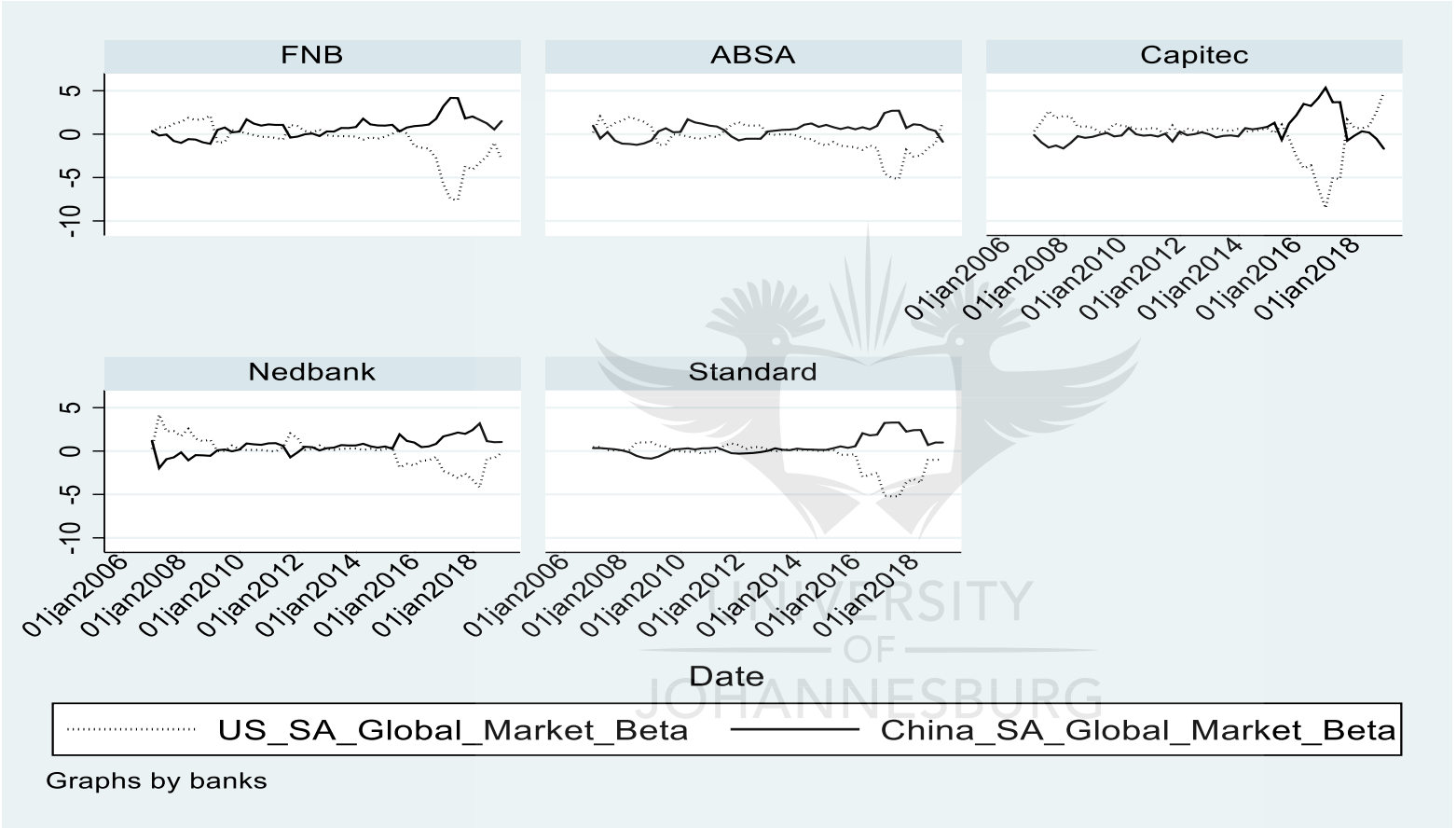


Figure 1: Market Beta Trends by Banks

Figure 1 above shows the results of the rolling window regression method, which provides information about the trend of association between the US and Chinese financial markets and the South Africa banking stock market. The beta trend analysis indicates that there is an interchanging variation of how the US and Chinese markets influenced the South African banking stock market over time. Consistent with the panel regression results reported in Table 7 above, the rolling period regression method results also confirm that the Chinese market's influence on the South African bank stock market has, in the middle of the interchanging pattern, dominated the US influence.

Figure 1 further indicates that despite the significant level of integration of all the banks throughout the study, there is a notable disassociation of banks' stocks with the US and the Chinese markets during the period of the global financial crisis. The declining trend of connectivity is more significant in the case of Standard Bank. The rolling window regression results also indicate that the relationship between the Chinese economy and the performance of South African bank stocks has been stable over time while the US economic stability association with the South African banks' stock performance has been volatile during the period of the global financial crisis. Comparatively, Standard Bank has, however, shown less volatility.

The results indicate that during the period of the global financial crisis, the influence of the US stock market on the South African bank stock market increased while the Chinese stock market declined. The results indicate that after the global financial crisis, the two global markets influences converged and remained stable. Around 2015, the influence of US market stock declined for all the banks while the Chinese market influence increased. In 2018, the influence of the two global markets converged again with ABSA and Capitec further showing the US influence surpassing the Chinese market influence. Although this is an indication of convergence for the other banks, the Chinese market influence remained dominant.

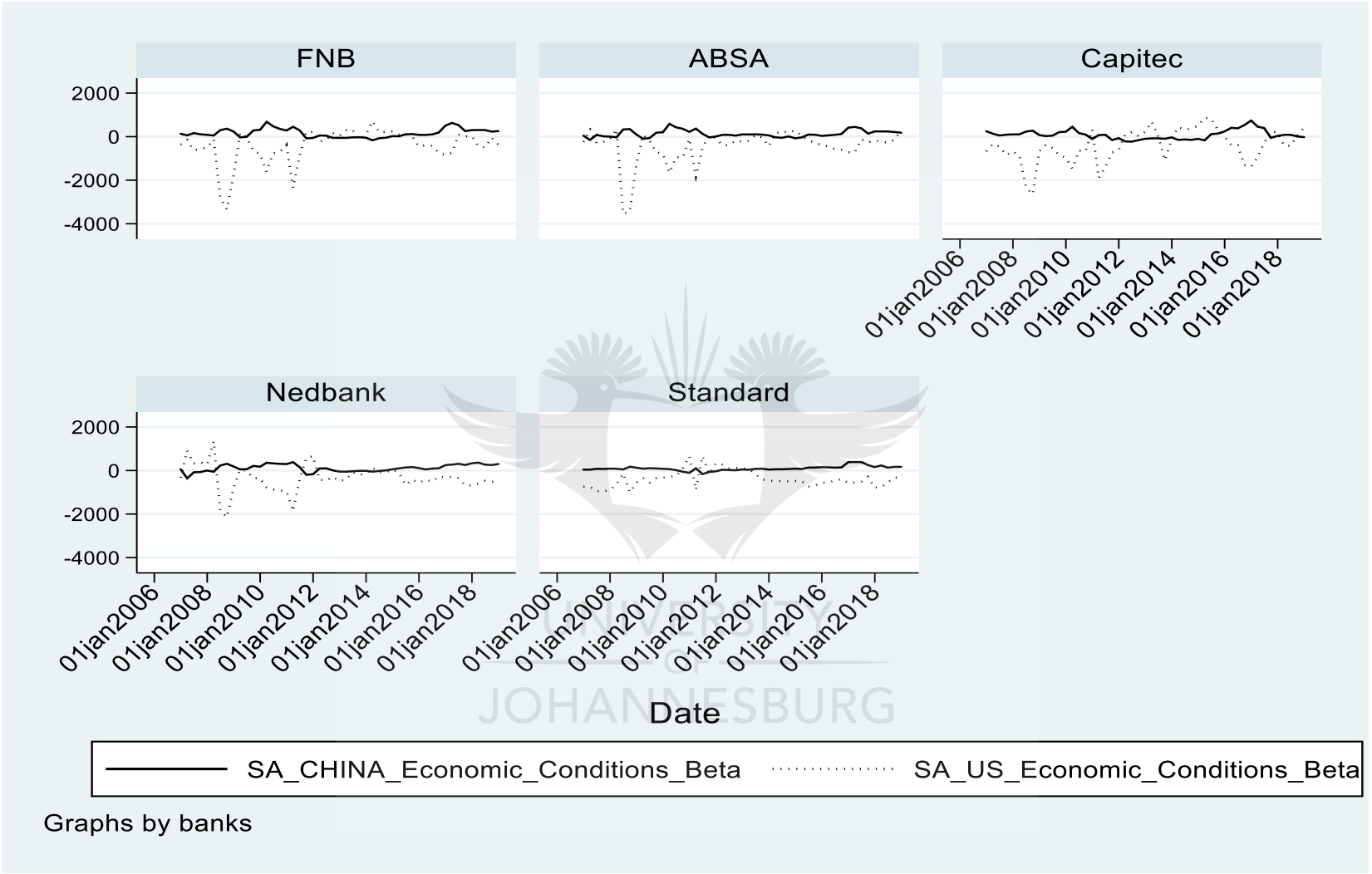


Figure 2: Economic Conditions Beta Trend by Banks

Figure 2 above indicates the trend of association between the US and Chinese economic conditions on the South African bank stocks. The results indicate that the association between the South African banks' stock market and Chinese economic conditions is consistently stable over time, even during the period of the global financial crisis. The stable trend is almost uniform across all the banks under observation. The US trend of association, on the other hand, is very volatile, especially during the period of the global financial crisis. The US trend is almost the same for all the commercial banks included in the study. On average, the level of the Chinese economic condition associated with the South African banks' stock market is higher than that of the US.

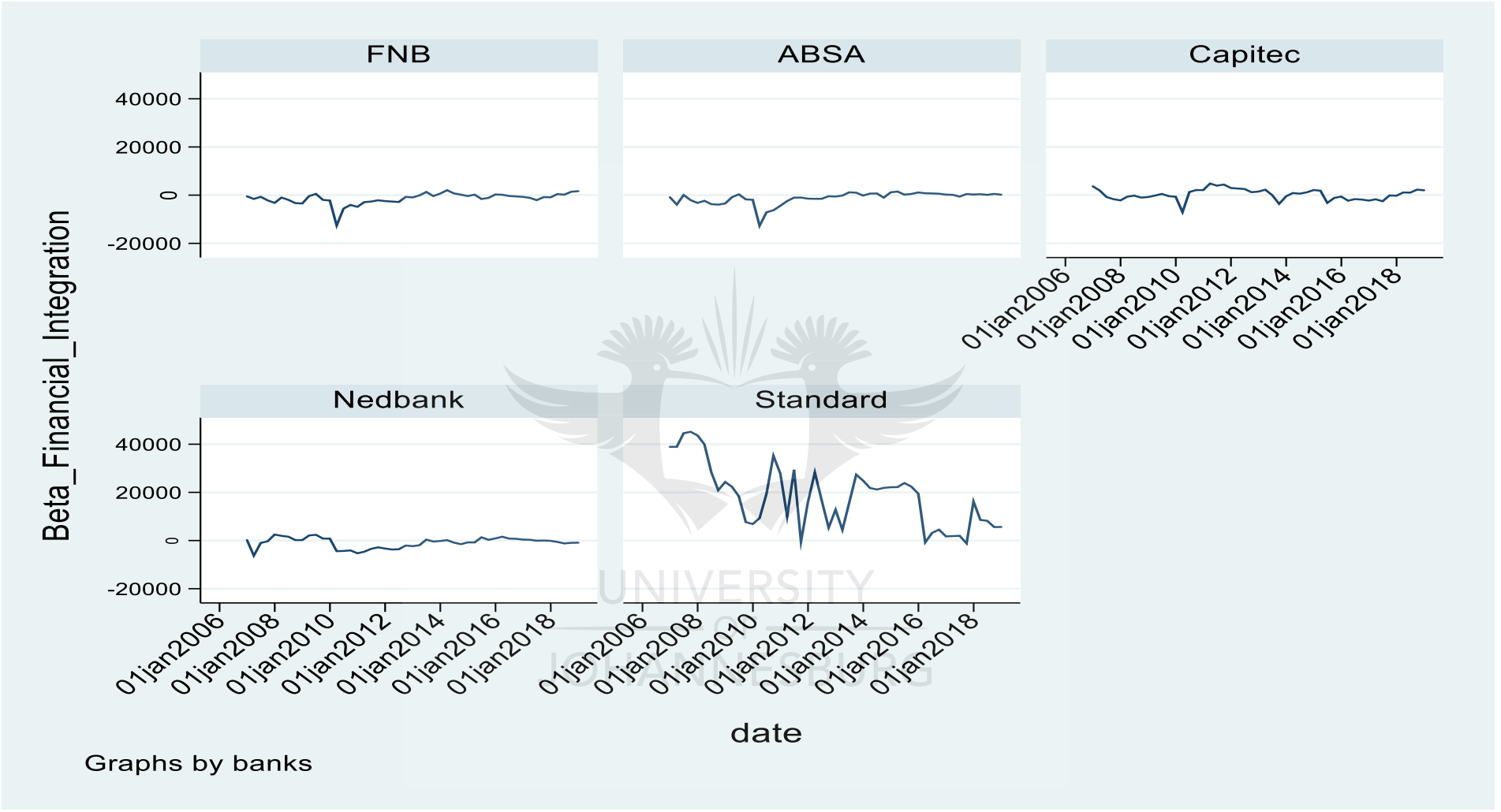


Figure 3: Financial Integration Beta Trend by Banks

Figure 3 above indicates the trend of association between financial integration and the South African bank stock performance. The degree of financial integration influenced the performance of South African banks in the sample in an almost consistent fashion. Standard Bank, one of the most operationally globalised banks in the sample, demonstrates a relatively unique pattern to the rest of the banks, exhibiting the most volatile trend. There is evidence of the drop in the relationship between the performance of financial integration and performance of the South African banks' stocks during the period of the global financial crisis.

4.6 Conclusions on this chapter

The objective of this chapter was to investigate the effect of the changes in global economic and market conditions on the performance of the South African banks' stock premia. The study compared the magnitude and nature of the influence of the US and China markets on the performance of the South African banks' stock performance. The study pursued to understand which of the two global-trade leading countries transmits most volatility shocks to the South African bank stock market. The chapter also sought to determine the effect of financial integration on South African stock risk premia. The need for this analysis was triggered by the continuous trade conflict between China and the US, which are the biggest trade partners of South Africa and the overall global trade leaders. To protect the domestic banks and the banking industry, it is necessary to observe the relationships that South Africa has with these two countries as their continued trade conflict could eventually affect the South Africa markets and its banks.

The study found that South African commercial banks' stock performance is synchronised to both the US and the Chinese global stock market. However, the pattern of the Chinese global market association seemed to be dominating the US association. The study further uncovered that the economic conditions prevailing in China affect the South African commercial banks' stock performance. The study established that the South African stock market responds negatively to economic conditions in the US. It is through these associations that the rivalry between the US and China can eventually affect the South African commercial banks' stock performance. The results have provided evidence that if the US successfully adopts policies

that are detrimental to the Chinese economy, these policies will eventually have a significant effect on the South African banks' stocks. At a national policy-making and implementation level, South Africa should strive to consistently adopt foreign trade policies that nourish its relationship with China to keep the banking industry in the country flourishing.

CHAPTER 5

The Effect of Global Financial Integration on South African Banks' Funding and Market Liquidity

5.1 Introduction

Liquidity risk and its management are critical concepts in the sphere of modern banking and the field of finance in general. The need for discussions on these risks, especially in banking, became even more imperative during and after the 2007-2009 global financial crisis. After the global financial crisis, there was a need to revisit and revise the Basel Accord II as it was thereafter deemed inadequate in some areas. The revised version of the accord was later put in place, countries soon after making commitments on adopting the new accord. South Africa undertook to undertake the implementation. The process of a global financial crisis is to a large extent the product of globalisation and its consequent elements such as international trade and global financial integration. It is the financial and trade links between countries that provides a passage for transmission of liquidity shocks across the globe. The objective of this chapter is to investigate the effect of global financial integration and its related elements such as the financial crisis, international business cycles, exchange rate volatilities and increased market competition, all of which result from the collapse of trade barriers between countries on the liquidity conditions of the South African banking industry. The study also looks at the effect of capital adequacy, which is the main substance driving Basel Accords on the liquidity of the banks in South Africa.

According to the South African Association of Banks overview report of 2014, the banking industry hosts 17 registered banks, 2 mutual banks, 14 local branches of foreign banks, 2 cooperative banks and 43 foreign banks with approved local representative offices. The South African banking sector is legislatively well regulated, its regulation subscribes to the requirements of the Bank of International Settlements (BIS) regulatory framework which ensures standards guaranteeing the overall safety, soundness and stability of banking systems

across the globe. South Africa has undoubtedly attempted to adhere to the series of regulatory accords and the respective amendments instituted by BIS both in the current period and previously. The South Africa banking sector authorities and the commercial banks committed to maintaining January 2018 as a deadline for implementation of the relatively newer Basel III Accord. The presence of foreign banks and foreign branches operating in the country's banking sector is a good indicator that South Africa operates a fairly open economy. The country's involvement in global leadership and its various memberships of international entities such as the G20, CIVETS and BRICS are other good indicators of South Africa's commitment to the global world.

Among others, global financial integration presents opportunities for portfolio diversification, reducing the cost of stock and reducing financing constraints (Colacito and Croce, 2010). Another major benefit of global financial integration is financial deepening and ease of access to capital as integration facilitates the free movement of capital across economies. As trade barriers collapse and restrictive financial boundaries dissolve, banks and other types of financial institutions are exposed to a much-broadened pool of capital funding and are presented with more alternative mechanisms for absorbing liquidity pressure. However, the WTO, which has been championing the creation of a fair platform for international trade, promotes fair and undiscriminating laws and regulations on foreign and domestic companies. WTO requirements also facilitate the entrance of foreign banks and other companies into domestic markets.

Foreign bank market entrance may lead to increased market competition. Keeley (1990) asserts that increased market competition can lead to the fragility of markets. Increased market competition by default has a negative effect on business profitability. In contrast, Boyd, Nicoló and Jalal (2005) contend that a more competitive market environment yields stability and that foreign bank entrance may reduce market concentration, thereby enhancing market efficiency.

Banks are functionally different from other types of business entities. Foreign bank entrance and ownership may present benefits to the domestic banking industry by boosting the completeness and efficiency of the interbank market. Financial integration affects banks in two

ways – by affecting what could be referred to as the funding liquidity risk and the market liquidity where the latter specifically points to the ease of trading of shares in the market. In the context of this study, the former specifically refers to the institutional ability to make financial commitments in a timely and cost-effective manner while the latter refers to the ease and cost-effective trading of the South African commercial bank stock in the market.

There is a limited amount of research on liquidity risk on South African banks and there is no research that specifically looks at the effect of financial global integration and its related factors on the liquidity conditions of the banks operating within the South African market. Sufian and Kamarudin (2016) incorporate some elements of globalisation in their analysis of the determinants of the performance of South African commercial banks. Although their study has globalisation at its core, it specifically focuses on performance in terms of profitability using (ROA) as a proxy for performance. The study at hand looks at the effect of the elements of globalisation on bank liquidity, not on bank profitability.

Another study that partially looks at what determines liquidity in South African commercial banks is that of Kumbirai and Webb (2010). Using financial ratios analysis, among others, the study investigates the effect of the global financial crisis on the funding liquidity of the banks operating in South Africa using data from 2005 to 2009. The financial ratio analysis methodology has a limitation as its results cannot show a cause and effect relationship which can be provided by regression analysis, which is the method used in the current study.

Esterhuysen, Vuuren and Styger (2012) investigated the effect of the global financial crisis on liquidity creation within the South African banking sector. They used data from 2004 to 2009 on eight banks listed on the Johannesburg Stock Exchange (JSE) using a 'cat fat' measure. Like Kumbirai and Webb (2010), their study only focused on the impact of the global financial crisis on liquidity and ignored the other important factors such as the direct effect of global financial integration as a variable and international business cycles. Kumbirai and Webb (2010) maintain that the global financial crisis resulted in low funding liquidity in South Africa. This current study, consistent with the studies of Baxter (2009) and Maredza and Ikhede (2013) alludes that the South African banking sector was relatively immune to the effects of the 2007-2009 global

financial crisis. The results of the current study also find a negative significant relationship between domestic economic growth (domestic business cycles) and market liquidity. The current study finds that funding liquidity is directly related to capital adequacy and changes in total assets. It uncovers a positive relationship between money supply and bank stock market liquidity. The study finds that bank stock market liquidity is directly associated with global financial integration, money supply and international business cycles. It further establishes both domestic business cycles and the Rand/Euro exchange have an indirect association with bank stock market liquidity.

Although there is some research on determinants of liquidity in South African banks, studies on the effect of global financial integration on both market and funding liquidity are inadequate in the context of the South African banking industry. This study seeks to close this evident gap in the literature. The results provide answers to the questions on the benefits and disadvantages of market liberalisation and global integration in developing countries. The findings can also be used by investors as a guide when making investment decisions, particularly for investors considering South African bank stocks. Lastly, this study is useful for bank management in planning liquidity. It is within the mandate of the regulators to ensure that the banks can adequately absorb potential liquidity problems; the results of this study provide answers to frequently asked question on the appropriateness of the Basel requirements in successfully solving banking sector liquidity problems.

5.2 Literature review

In a globalised financial market landscape, the continuous interactions between markets and trade agents bring some form synchronisation across the participating economies. Financial trade integration and globalisation at large allow the transmission of all types of financial shocks across these economies, creating some contagion effect and vulnerability across the global financial landscape. This study performs a global analysis of the factors that determine funding liquidity and the market liquidity for South African commercial banks. Key among the global factors under scrutiny are financial integration, financial crisis, international business cycles and exchange rate. Literature has shown contradictory results on which factors determine funding liquidity and market liquidity.

El Khoury (2015) investigated factors determining liquidity risk in the banking sector. Using Lebanon bank data from 2005 to 2013 and a combination of dynamic, fixed and random effect panel regression models, the study estimates four equations with four different proxies for funding liquidity. The results reveal a positive association between bank liquidity and bank size, the interbank market, the loan book size, inflation and financial crisis. The results of the study indicates an insignificant relationship between bank liquidity and capital, economic growth and the level of unemployment.

Patora (2013) examines the determinants of bank liquidity in five countries from Central and Eastern Europe using data from 2004 to 2012 based on a sample of 21 banks. The study uses pooled OLS as a method of analysis. The results indicate that the liquidity position of the banks is negatively affected by changes in capitalisation and the market share. The study further establishes a positive relationship between bank liquidity and unemployment rate and bank profitability.

Trenca, Petria, Mumu and Corovei (2012) investigates the determinants of bank liquidity in Central and Eastern Europe using quarterly data from 30 commercial banks for a period of 44 consecutive quarters from 2001 to 2011. The results of the study indicate a negative relationship between lending rates and the liquidity of the banks. Consistent with Patora (2013), the results also reveal that capitalisation negatively affects bank liquidity.

Using the generalised least squares (GLS) method and covering the period 2006 to 2013, Gafrej and Abbes (2017) analyses and compares the effect of bank-specific factors and macroeconomic factors on liquidity conditions of Islamic banks and conventional banks. The results reveal that the liquidity position is very persistent for Islamic banks as it influences the preceding period liquidity position. The study further establishes a negative association between liquidity and capitalisation. This observation is consistent with the findings reported by Patora (2013). Gafrej and Abbes (2017) also uncovers a positive association between the liquidity position and profitability and capitalisation for conventional banks , the study further establishes a negative relationship between liquidity holding and inflation rate as well as size. This negative association between funding liquidity, bank size and capital adequacy is

confirmed in the Zimbabwean study of Laurine (2013) conducted after the country had adopted a multi-currency system. The study used panel data regression on 15 commercial banks' monthly data spanning a period 2009 to 2012.

Umar and Sun (2016) analyses the determinants of bank liquidity in BRICS countries for the period 2002 to 2014 using multiple linear regression. Contrary to Gafrej and Abbes (2017) and El Khoury (2015), which indicate bank size as one of the major determinants of liquidity, Umar and Sun (2016) reports that bank size bears no significant effect on the liquidity of the BRICS banks. The study also establishes that the financial crisis had a negative effect on the liquidity position of BRICS banks.

Using a combination of OLS and Fully-Modified Ordinary Least Squares (FMOLS) regression methods, Kašparovská, Laštůvková and Střelec (2016) examines the Czech banking sector over the period 2003 to 2014. The results of the study indicate a positive significant association between the Czech Koruna (CZK) and Euro fluctuations and the liquidity position of the banks. The study also indicates that the interbank offer rate and inflation bears a negative effect on the liquidity of the banks. The results further show that GDP does not bear any significant effect on the liquidity position of the banks.

Vodova (2011) uses panel regression analysis on financial data from the Czech banking sector covering the period 2001 to 2009. The results uncover a positive association between bank liquidity and capital adequacy and that inflation, the financial crisis and business cycles have a negative effect on bank liquidity. Vodova (2013) uses the same methodology in a similar study on the determinants of bank liquidity for Hungarian commercial banks using data spanning a period from 2001 to 2010. Consistent with the findings in the Czech banking sector, the results of the study indicate that capital adequacy has a positive relationship with the liquidity of the banks. The study further reveals that interest on loans and monetary interest rates and interbank rates also has a direct relationship with the bank liquidity position. However, the reported relationship between business cycles and liquidity is ambiguous.

Chordia, Sarkar and Subrahmanyam (2005) analyses the determinants of funding and market liquidity on the New York Stock Exchange (NYSE) stocks from 1991 to 1998. Using VAR and the difference between the bid and offer price as the indicator of market liquidity conditions, the study uncovers that an expansionary monetary policy increases market liquidity and encourages high levels of market trading. The results further reveal that increased mutual fund flows could lead to decreased liquidity as this puts negative pressure on market-marketer inventories.

Using data from 1962 to 2003 on US bond and stock markets, Goyenko and Ukhov (2009) estimates a VAR model to analyse liquidity linkages between stock and treasury bond market. The study establishes that there a bidirectional relationship between these two markets. Monetary policy affects stock market liquidity through some form of a transmission mechanism. The study alludes that monetary policy affects stock market liquidity through the relationship that the significant association that the policy has on the bond market liquidity. The bond market liquidity conditions are thus a passage through which the monetary policy shocks are transmitted to affect liquidity.

Drechler, Savov and Schnabl (2018) examines the effect of monetary policy transmission mechanisms on the liquidity premia of stock using the US data using trend analysis based on historical data. The study reveals that monetary policy has a significant effect on the stock premia through as through its mechanisms has an effect on the supply of credit in the financial system at any given point.

5.3 Methodology and variables used

5.3.1 Liquidity measures

There are two types of liquidity risk: funding liquidity risk and market liquidity risk. The former refers to the institutional ability to cost-effectively meet both current and future anticipated and unanticipated financial obligations as they fall due. The latter refers to the institutional ability to eliminate or offset financial positions without causing market price

disruption. Business institutions mainly raise funding through two basic mechanisms: debt financing or selling stock. While banks are also business institutions, one of their unique characteristics is that unlike other types of business institutions, the functional nature of their business and their *modus operandi* permits them to accept and take deposits. This is thus key in the creation of liquidity for their business. They also have other forms of funding interventions such as the interbank market facilities as well as temporary funding facilities that can be provided by regulators from time to time. Like any other business entities, the banks are also listed on stock exchanges, implying that they can also issue stocks. This is another important element in determining the liquidity of the banks.

5.3.2 Measuring funding liquidity risk

Various studies such as those of Vodova (2011; 2013), El Khoury (2015), Patora (2013), Laurine (2013), Umar and Sun (2016) and Gafrej and Abbes (2017), use different measures to analyse the funding liquidity. The most popularly used measures are the liquid assets to short-term funding and deposits ratio, liquid assets to total assets ratio, liquid assets to deposits ratio and the loans to total asset ratio. These measures use different variables in the calculation, however, they uniformly provide information about a banking institutions' capacity to absorb liquidity shocks. To analyse liquidity, this study uses the loans to total assets ratio expressed as follows:

$$Funding\ Liquidity = \frac{Loans}{Total\ Assets} \tag{18}$$

This ratio calculated the share of loans to total assets, indicating the percentage of assets tied up in liquid assets (Vodova, 2011). The high calculated value of the ratio suggests a lower liquidity absorption capacity of the bank. The adopted measure has also been used as a proxy for credit risk in studies such as that of Zaghdoudi and Hakimi (2017). Unlike the other widely used measures of liquidity, the strength of this measure relative to its peers rests on the fact that this ratio also indicates the credit risk position of the bank at any particular point.

5.3.3 Measuring market liquidity risk

Chen, Chung, Lee, Liao (2007) alludes that there is no generally dominating measure or indicator of stock market liquidity in the literature. There are several measures used t as indicators of market liquidity in other studies stock market liquidity is measured with reference to trading volume while other studies use transactional-based indicators such bid-ask spread (Sidhu and Kaur, 2019). Other popularly uses indicators of market liquidity such as the return reversal developed by Pastor and Stambaugh (2003). Other studies such as Lesmond *et al.* (2005) use a measure based on the standardised number of trading days and trading volume. Other studies use the bid and ask spread as an indicator of stock market liquidity. This measure is one of the measures that are transaction-based. A wider bid and ask gap indicates decreasing market liquidity also indicating higher trading costs. This measure has been used in studies such as Amihud and Mendelson (1986), Chordia *et al.* (2005) and Goyenko and Ukhov (2009). Other indicative measures include the periodic volume of traded securities. To estimate commercial bank stock market liquidity, in the absence of the data on bid and offer prices for the early period of the study, this study uses the percentage change in the price of the stock, which indicates the stock price movement. The measure is derived as a periodic difference between the market closing price and the marketing opening price functionally expressed as follows:

$$Market\ Liquidity = (Closing\ price - Opening\ Price) \quad (19)$$

Just like the bid and offer margin, this measure reflects the market trading activity. It provides the periodic actual overall returns generated by the market agents. The opening and closing market price accurately reflect the interaction between the demand and supply forces in the stock market as it indicates the actual traded positions on the day. The positive gap indicates that the closing market price is higher than the opening market price. Borrowing from the fundamental principles of economics, an increase in prices is driven by an increase in demand relative to supply. High demand for bank stocks signifies ease of stock trade and highly liquid market. A negative gap, on the other hand, indicates a situation where the market prices have crushed as the opening price is higher than the closing price. Using the same intuition, the fall in prices indicates a decline in demand hence an illiquid market. For both cases of a liquid and

an illiquid market, the bigger the margin value calculated, the more intense the observed condition.

5.3.4 Model specification

Most studies such as Umar and Sun (2016 and Drechler, Savov and Schnabl (2018) have analysed funding liquidity and market liquidity risk individually. In this chapter, this study pursues to analyse liquidity for the banks estimating both the funding liquidity and the market liquidity. In the following section, the liquidity models are discussed and presented.

Funding Liquidity Estimation

In estimating the funding liquidity, like the study of Tow et al. (2019), this study includes economic growth, capital adequacy, market concentration and bank size. Abdul-Rahman, Jusoh and Amin (2018) and Kim (2018) also considers the market structures in estimating funding liquidity. Also consistent with Chiu (2014) this study recognises monetary policy and money supply as determinants of funding liquidity for the banks. Like Inekwe, Jin and Valenzuela (2018), global financial integration is included in the model as the determinant of funding liquidity in this study. The study also considers the financial crisis as a factor determining funding liquidity, Khan, Scheule and Wu (2017 also includes financial crisis as an important factor determining funding liquidity.

Market Liquidity Estimation

Closely following Drechsler *et al*. (2018), Zhang, Kashif and Cao (2019) and Li, Lu, Ren and Zhou (2018) this study also considers the effect of monetary policy as a crucial factor in determining stock market liquidity. Johann, Scharnowski, Theissen, Westheide, and Zimmermann (2019) include the financial crisis in analysing the determinants of market liquidity; this study also recognises financial crises as a factor that can influence stock market liquidity. Consistent with Murugesu, and Sakaran (2018) this study also identifies global financial integration as one of the determinants of stock market liquidity. The study also

considers the volatility in the domestic currency as an important factor determining stock market liquidity, Huang and Stoll (2001) also acknowledges exchanges rate as a major determinant of stock market liquidity.

$$FUNDLIQ_t = \alpha_0 + \beta_1 FININT_t + \beta_2 FINCRIS_t + \beta_3 MARKETCONC_t + \beta_4 CAPADEQ_t + \beta_5 TASSET_t + \varepsilon_t \quad (20)$$

$$MARKLIQ_t = \delta_0 + \gamma_1 FINCRIS_t + \gamma_2 FININT_t + \gamma_3 EXCHRATE_t + \gamma_4 INTBUSCYCLES_t + \gamma_5 DOMBUSCYCLES_t + \gamma_6 MS_t + \varepsilon_t \quad (21)$$

Where; $FUNDLIQ_t$ denotes funding liquidity at time t, $FININT_t$ represents Financial Integration at time t, $FINCRIS_t$ represents global financial crisis at time t (A dummy variable). $MARKETCONC_t$ proxies market concentration at time t measured by HHI, $CAPADEQ_t$, denotes capital adequacy at time t. $TASSET_t$ denotes bank size measured by total Assets at time t. $EXCHRATE_t$ represents Euro Rand Exchange rate at time t. $INTBUSCYCLES_t$ captures the effect of international business cycles at time t, $DOMBUSCYCLES_t$ represents domestic business cycles at period t, MS_t denotes money supply at period t and ε_t represents the error term. Table 8 below summarises the variables used in the study. The summary includes the notation of the variable and the description and the source of the data for each variable.

Table 8: Definitions of Variables Liquidity Models

Variable Notation	Variable	Description	Source
Dependent Variables			
Fundliq	Funding Liquidity	$\frac{Loans}{Total\ Assets}$	Bankscope
Marketliq	Market Liquidity	Closing Price Less Opening Prices	INET BFA
Independent Variables			
MS	Money Supply	Indicates economic liquidity	Reserve Bank
FININT	Global financial integration	Net foreign asset divided by gross domestic product	Reserve Bank
EURZARXrate	Exchange rate	Zar/Euro	Reserve Bank
FINCRIS	Global Financial Crisis	A dummy variable taking a value of 1 during a period of the financial crisis, otherwise 0	
INTBUSCYCLE	International Market Economic Cycles	Change in economic growth (change in GDP) in OECD countries	INET BFA
DOMBUSCYCLE	Domestic Market Economic Cycles	Change in economic growth (change in GDP) in South Africa	INET BFA
HHI	Herfindahl-Hirschman Index (HHI) calculated on Assets	Measures market concentration	Bankscope
CAPADEQ	Total regulatory capital	Measures capital adequacy	Bankscope
LNTA	Log (total assets)	Indicates Size	BankScope

5.3.5 Estimation of the econometric model

Literature has indicated that funding and market liquidity are partially determined by the same factors, the same is observation is highlighted in section 5.3.4. The identified commonality in the determination of these two types of liquidity risks warrants and justifies estimation of the mentioned risks as a system of equations. The study estimates the system using the Zellner's Seemingly Unrelated Model (SUR) estimated in Structural Equation Model (SEM), using the Huber/White/sandwich estimator. When the models do not fully have the same explanatory variables estimating the Zellner's Seemingly Unrelated Model (SUR) leads to relatively more efficient results than if the equations were estimated separately. The benefit of estimating SUR using SEM approach is that the standard errors yielded from SEM are more statistically reliable compared to those produced by the SUR when the model that is being fitted is recursive in nature. SEM also estimated standard errors on variances and covariances, which cannot be attained if the SUR Model is estimated conventionally. Estimating SUR using SEM further produces a more robust result than estimating the model using a conventional seemingly unrelated model. One of the benefits of this estimation method is that there is no requirement for the errors to follow a normal distribution, nor is it required that they are identically distributed from one observation to the next. The Huber/White/sandwich estimator also provides estimates that are robust to heteroscedasticity.

5.4 Empirical results

The study estimates liquidity risk for South African commercial banks using annual data on 14 South African commercial banks spanning the period 2004 to 2018. Different data sources are used to obtain the data used in this chapter of the study. Economic data such as money supply GDP and data used to produce global financial integration data is obtained from the South Africa Reserve Bank database. Bank-specific financial data is sourced from bankscope while market-related financial data is sourced from INET BFA. The results of the study show that for both the funding liquidity and the market liquidity, the results of the Wald test indicates that all the coefficient in the system are significant, thus leading to the rejection of the null hypothesis that the coefficients were 0. Application of the Wald test is necessary to test if the explanatory variables included in the model are jointly significant. The overall goodness of fit,

measured by R-squared, is 0.84 indicating a good fit of the model. The equation level goodness of fit is 88 percent for the market liquidity and 56 percent for the funding liquidity. This measure explains the variability of the response data around its mean, the reported R-squared is comparatively higher for the market liquidity equation, the results are provided in Table 9 below.

Table 98: Liquidity Model Regression Results

	DEPENDENT VARIABLE: FUNDING LIQUIDITY		**DEPENDENT VARIABLE: MARKET LIQUIDITY**	
INDEPENDENT VARIABLES	Coeff.	Std Err	Coeff.	Std.Err
FININT	1.352027	1.811756	124.3898***	40.99045
FINCRIS	1.183186	3.970347	665.908***	79.52652
MS	-5.82E-06**	2.96E-06	0.001813***	0.00041
CAPADEQ	5.13E-05**	2.24E-05	-	-
HHI	-52.9632	40.09247	-	-
LNTA	2.669425***	0.561087	-	-
EURZAREXCH	-	-	-4.3781***	0.349924
INTBUSCYCLE	-	-	23294.37***	1553.429
DOMBUSCYCLE	-	-	-12027.1***	1299.07
CONSTANT	41.63585***	8.254095	-552572***	51726.96
VAR(E.LIQRISKNETLOANSTOTASSETS)	150.2015	19.45687		
VAR(E.BANKLIQUI)	52243.17	4884.345		
(E.LIQRISKNETLOANSTOTASSETS,E.BANKLIQUI)	108.2444	265.0386		
The overall model goodness of fit (R-squared)	0.84			
The equation level goodness of fit (R-squared)		0.56		0.88
Wald test	Degrees of freedom (6)	70.71***		520.43***
No. observations		139		139

*Denotes 10% level of significance, ** and *** denote 5% and 1% levels of significance respectively.

In this chapter, this study investigates how globalisation, financial integration and other market-related factors affect funding liquidity and market liquidity conditions of the commercial banks operating in South Africa. The results indicate that global financial integration has a positive non-significant effect on the South African banking sector funding liquidity conditions. The results also demonstrate a significant positive effect of global financial integration on bank stock market liquidity; this implies that increasing the level of integration of the banking industry to the global environment enhances ease of trading of South African commercial banks' stocks. The observed association is possible because global financial integration process has a way of broadening the markets by making them easily accessible to international market agents.

The results of this study indicate that reducing market concentration by increasing competition among others through inducing ease of foreign bank market entrance has no significant effect on the funding liquidity of the commercial banks in South Africa. In the context of this study, market concentration refers to the magnitude of the control of the market by the large banks which can also be defined as a market monopoly. In globalised market conditions that allow the entrance of foreign banks, increased market competition due to the foreign banks' presence, should decrease the level of market concentration.

This study finds that the global financial crisis had no significant effect on the funding liquidity conditions of the commercial banks operating in South Africa. However, the results also indicate that during the period of the global financial crisis, the market liquidity conditions in the South African banking improved implying that the South African banks' stock markets were relatively immune to the global financial crisis. The relative resistance of South African banks to the global financial crisis is also reported in the studies of Baxter (2009) and Maredza and Ikhede (2013), which indicate that the global financial crisis effect was relatively not detrimental to the South African banking sector. Improvement in market liquidity for a market during a period of the financial crisis is possible if that specific market promises better returns and lesser levels of uncertainty relative to other markets belonging to other countries. Relatively better returns and increased certainty enhances the demand for the stocks and liquidity conditions.

Closely related to the concept of the global financial crisis as a factor determining both the funding and the market liquidity condition are business cycles. Globalised markets allow transmission of economic and other related shocks across markets, leading to a possible synchronisation of the markets. The results indicate a direct significant association between international economic growth and the improved market liquidity conditions. This observed positive effect of the international environment on market liquidity is consistent with the positive relationship between global financial integration and market liquidity conditions discussed above. The results of this study further indicate an indirect significant relationship between domestic economic growth and market liquidity of the South African bank stocks.

The South African commercial banks' regulation is based on the Basel regulatory requirements, which, through their multi-pillared framework, seek to promote greater financial market stability across the globe. Among others, financial stability can be achieved by ensuring that credit risk and liquidity risk are effectively managed by banks in the industry. Consistent with the findings of Vodova (2013) in Hungary and Laurine (2013) in Zimbabwe, the results of the study indicate a positive association between a total capital requirement and the funding liquidity risk. The finding implies that increasing required capital puts funding liquidity pressure on the banks. This finding further indicates that the recently adopted stringent Basel III accord that the South African banking industry has recently adopted is likely not to inflict a negative impact on the liquidity of the South African banking industry.

The results of this study provide evidence that there is a positive association between bank size and funding liquidity risk this finding is supported by *Appendix 19*, which also indicates a strong positive association between funding liquidity and the bank size. This finding is consistent with the findings of Laurine (2013) and El Khoury (2015), who also report a positive relationship between change in bank asset and liquidity conditions in Zimbabwe. An increase in the volume of total assets ties up cash thus compromising liquidity conditions of an institution as most of the assets could be illiquid in nature.

The market liquidity conditions of a banking industry can also be determined by the broader economic liquidity conditions prevailing in the country. The money supply is used in this study as an indicator of economic liquidity conditions. The results indicate a negative association between the money supply variable and the funding liquidity while it indicates a positive association between money supply and the market liquidity conditions. This implies that an expansionary monetary policy would reduce funding liquidity pressure on commercial banks. Equally, the results also indicate that an expansionary monetary policy would have a positive effect on the market liquidity of the banks. Other studies with similar results include those of Apergis and Eleftheriou (2002) on Greek stocks and Asprem (1989) on data stock prices from a panel of ten European countries.

Global financial integration broadens markets by allowing international economic agents to participate in markets that are otherwise not their own. The stability of exchange rates between countries thus become critical in determining the level of trade participation. The results of this study indicate a negative significant association between the Euro/Rand exchange and the market liquidity of commercial bank stocks. The results imply that weakening of the Rand against the Euro significantly enhances the market liquidity of commercial bank stocks. When the Rand depreciates against other international currencies, it becomes relatively cheaper for international investors to buy stocks and other assets in South Africa.

5.6 Opportunities for further research

There are critical elements of liquidity risk and banking that this study has not attempted to answer. The results of this study have indicated the importance of the international environment and its effect in determining both funding and bank stock market liquidity in the context of the South Africa banking sector. The presence of foreign banks in local markets is one of the major indicators of the level of global openness state of a country. However, such presence creates a passage, paving the way for the transmission of international liquidity shocks into local markets. There is a need to further analyse and establish the disadvantages and opportunities presented by global financial

integration and the concomitant entry of foreign banks. Understanding the magnitude of the contagion effect between domestic banks and foreign banks is critical.

5.7 Conclusions on this chapter

In this chapter, the study investigated the effects of global financial integration on the funding and market liquidity of banks operating in South Africa. The results of the study indicated that global financial integration, global financial crisis and market concentration do not have any significant effect on the funding liquidity of South African commercial banking industry. The study also uncovered that an expansionary monetary policy reduces both funding and market liquidity pressure in the South African banking industry. Global financial integration, the global financial crisis and economic growth in the international environment indicating economic cycles have been found to inflict a positive effect on the South African commercial banks' stock market liquidity. South Africa is currently one of the dominant countries in Africa, advocating all forms of trade interactions among fellow African countries, it is also a member of the G20, Civets and BRICS. Global financial integration has a positive effect on market liquidity and suggests that if the national policy objective is to achieve greater market liquidity, the country should adopt the policies that embrace global financial integration.

From January 2007, South Africa embarked on the implementation of the more stringent and conservative BIS Basel III regulation reform. The Basel III accord emphasis on banks holding and reserving capital to counter and absorb losses as an when they occur. The accord further prescribes the quality and quantity of capital to the banks have to maintain periodically. This study has shown that increasing the quantity of capital in response to the regulatory requirements is beneficial to the industry as it improves on the funding liquidity conditions of the banking industry in the country.

CHAPTER 6

6.1 General Conclusions and Recommendations

This study was motivated by the uncertainties that arose when the UK and the US began disrupting the progress that has made to date to globalise trade and the world at large. The UK had been long threatening to exit the European Union. The US, for its part, had made threats to build a wall between itself and Mexico, thus brewing a spirit of detachment and isolationism, and later embarked on a tariff war against China. All these events are contrary to the spirit of globalisation which institutions such as the WTO have been striving to promote. These events may also motivate other countries to question their stance, role and benefits they reap from globalisation and its related elements such as financial integration.

This study analysed the effect of global financial integration and other related global factors on the financial performance, efficiency and stability of the South African banking sector. The study added to the ongoing debate on the pros and cons of global financial integration for the banking sector of hosting countries. The specific focus of this study was South Africa, which is classified as one of a unique cluster of nations, known as Newly Industrialised Countries (NICs).

The study was divided into six chapters. The first chapter introduced the topic while the last chapter provided the conclusions. The remaining chapters were more empirical in nature. Chapter 2 looked at the effect of global financial integration on the South African banking industry. It compared the strength of foreign and domestic banks' business strategies in addressing profitability. The home field advantage hypothesis was then tested to see if it held in the context of the South Africa banking industry. Thereafter, it was determined whether foreign and domestic banks could co-exist and remain profitable without negatively affecting each other's financial performance. The results of the study indicate that in general, the South African banking sector's profitability is not significantly affected by global financial integration. Moreover, the study indicated that foreign banks and domestic banks operating in South Africa could coexist without negatively affecting

each other's profitability. At a much broader level, for the case of newly developed countries, the performance of foreign banks and domestic banks was not different and the two categories of banks were found to compete fairly.

The study further provided evidence that foreign and domestic banks adopted different operational business strategies and that, there are indeed discriminating factors determining the financial performance of these two categories of banks. The domestic banks demonstrated an upper hand in managing factors such as liquidity and credit risk, thus indicating that the home field advantage hypothesis did hold for traditional banking business risks. However, for risk emanating from the banks' external environment, the results were less conclusive. The results further indicated that foreign banks are passive to changes in domestic economic conditions. This should not necessarily be seen as a weakness as it could simply be a matter of a choice of the strategy adopted by the foreign banks.

The study results revealed that unlike their foreign counterparts, domestic banks are affected by business cycles risk and inflation risk. The results further indicated that the domestic banks are superior in anticipating inflation and making the necessary strategic adjustments to stay profitable. However, the domestic banks indicated a weakness in their ability to make adjustments to their asset and liability books to absorb the pressures of changes in money market rates whereas their foreign counterparts were immune to such changes.

In terms of national policy on international trade, the findings indicate that the open trade policy which South Africa is gearing towards as it adheres to WTO requirements has not inflicted any significant disadvantages on the profitability of the South African banking industry. Although national policies should continue promoting global integration, studies of this nature should be conducted continuously to determine the extent of the effect of financial integration on the country's banking industry, as this could change over time.

In Chapter 3, the study focused on the effect of global financial integration and other global elements on the efficiency of the South African banking. By default, allowing foreign bank entry into the South African banking sector increases the level of competition in the market. The chapter examined the effect of competition on the cost-efficiency of the banking industry and sought to determine which banks were more efficient between the foreign and domestic banks. Most importantly, this chapter looked at whether economies of scales still exist in the South African banking industry.

The findings indicated that financial integration significantly increased the costs in the South African banking industry. The study also uncovered that, when market competition decreased, the costs in the banking sector also decreased. Even though the study has found no significant difference in the profitability of the foreign banks and the domestic banks as reported in chapter 2 of the study, in chapter 3, the study uncovered that foreign banks are more cost-efficient than their domestic counterparts. This established inconsistency is possible. Although the concept of efficiency and profitability are related to a reasonable degree, they can also occur independently. A firm can be cost-efficient without being profitable, in the same breath, a firm can also be profitable without being cost-efficient. The findings allowed the study to rule in favour of the global field advantage hypothesis for the case of cost-efficiency.

China and the US are currently the world biggest global players and they are also South Africa's biggest trading partners. The two countries are currently in the middle of a trade conflict. Through their trade association with South Africa, this conflict may affect South Africa and all its different sectors. This study sought to establish and compare the connectivity of the South African banking industry to both China and the US. Amidst this conflict between the two countries, South African policymakers must understand these relationships for national policy planning. This study specifically looked at how the Chinese and US markets influence the performance of the stocks of banks operating in South Africa. The findings established that the South African stock market was synchronised with both the US and the Chinese global markets, however, the Chinese influence on the performance of commercial banks' stock was greater than the US influence. The findings also reveal that commercial banks' stock performance was directly connected to the economic

conditions in China. While South Africa must nurture its relationship with both China and the US for economic and strategic reasons, the study has confirmed that policymakers should prioritise on nourishing the relationship with China.

The literature points out that improved liquidity conditions are one of the key benefits of global financial integration. This study analysed this concept, considering the effect of financial integration on both the market liquidity and the funding liquidity of the South African banking industry. The findings revealed that global financial integration has a positive effect on the South African bank stock market liquidity condition. The study has however also revealed that global financial integration has not brought any added benefits nor detriments to the South African banking sector funding liquidity situation. The results further indicated that there is a direct, significant association between international market economic conditions and the market liquidity of South African commercial banks' stocks. During periods of high economic growth in the international environment, the market liquidity of the South African banks' stocks improves. This study has provided evidence that being a part of a global world and subscribing to the terms of free trade has contributed positively to the betterment of the South African banking sector. The findings of this study demonstrated that if the national policy goal is to enhance bank-related stock market liquidity, the country should embark on policies that embrace global financial integration. The study further provided evidence that expansionary monetary policies are good for improved banks' stock market liquidity and the funding liquidity.

The South African banking industry conforms to the BIS regulatory standards and requirements. Chapter 5 of the study provided evidence that ensuring capital adequacy has a positive effect on the liquidity conditions of the South African banking industry. Chapter 2 of this study has also indicated that liquidity risk exposure has a negative significant effect on the profitability of the South African domestic banks. However, the results of the chapter have shown that liquidity risk exposure has no significant impact on the financial performance of the foreign banks operating in the country. Capital adequacy was not included in the profitability analysis models because its data could not adequately fit in the model without causing econometric distortions. Using information provided by chapter 5 on the relationship between capital adequacy and liquidity conditions and

chapter 2 on liquidity risk and profitability, with a reasonable probability of accuracy, it can be deduced that implementation of the Basel III will improve liquidity conditions and profitability of the South African banking industry. The significance and validity of the made inference is biased and limited to the situation of the domestic banks as foreign banks' profitability is not affected by their liquidity risk exposure.

REFERENCE LIST

Abdul-Rahman, A. I. S. Y. A. H., Jusoh, N. A., Mohammed, N., & Amin, S. I. M. (2018). Market Competition and Liquidity Risk: Lessons from Malaysia. *International Journal of Economics & Management*, *12*(2).

Aigner, D.J., Lovell, C.A.K., & Schmidt, P. (1977). Formulation and estimation of Stochastic. *Review of Economic and Statistics*, 80(3), 454-465.

Allen, J. & Liu, Y. (2007). Efficiency and economies of scale of large Canadian banks. *Canadian Journal of Economics / Revue Canadienne Economique*, 40(1), 225-244.

Andries, A.M. & Capraru, B. (2013). Impact of Financial Liberalization on Banking Sectors' Performance from Central and Eastern European Countries. *PLoS ONE* 8(3), e59686. doi:10.1371/journal.pone.0059686

Apergis, N. & S. Eleftheriou. (2002). Interest Rates, Inflation & Stock Prices: The Case of the Athens Stock Exchange. *Journal of Policy Modeling*, 24,(3), 231-236.

Asprem, M. (1989). Stock Prices, Asset Portfolios and Macroeconomic Variables in Ten European Countries. *Journal of Banking and Finance* 13(4–5), 589-612.

Assaf, A.G., Matousek, R. & Tsionas, E.G. (2013). Turkish bank efficiency: Bayesian estimation with undesirable outputs. *Journal of Banking and Finance*, 37(2), 506-517.

Athanasoglou, P.P., Brissimis, S.N. & Delis, M.D. (2008). Bank-specific, industry-specific and macroeconomic determinants of bank profitability. *Journal of International Financial Markets, Institutions and Money*, 18(2), 121-136.

Azam, M. & Siddiqui, S. (2012). Domestic and foreign banks' profitability: Differences and their determinants. *International Journal of Economics and Financial Issues*, 2(1), 33-40.

Banz, R.W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics, 9*(1), 3-18.

Bardhan, A., Edelstein, R. & Tsang, D. (2008). Global financial integration and real estate security returns. *Real Estate Economics*, *36*(2), 285-311.

Baxter, R. (2009). The global economic crisis and its impact on South Africa and the country's mining industry. *Challenges for Monetary Policy-Makers in Emerging Markets*, 105-116.

Ben Naceur, S. & Omran, M. (2011). The effects of bank regulations, competition and financial reforms on banks' performance. *Emerging Markets Review*, 12(1), 1-20.

Bentes, S.R. (2015). On the integration of financial markets: How strong is the evidence from five international stock markets? *Physica A: Statistical Mechanics and its Applications*, 429, pp.205-215.

Berger, A. N. & Mester, L. J. (1997). Inside the black box: What explains differences in the efficiencies of financial institutions? *Journal of Banking and Finance*, 21(7), 895-947.

Boako, G. & Alagidede, P. (2016). African stock market convergence: Regional and global analysis. *Finance Research Letters*, 18, 317-321

Boako, G. & Alagidede, P. (2017). Co-movement of Africa's equity markets: Regional and global analysis in the frequency-time domains. *Physica A: Statistical mechanics and its implications*, 468, pp.359-380

Bonin, J.P., Hasan, I. & Wachtel, P. (2005). Bank performance, efficiency and ownership in transition countries. *Journal of Banking and Finance*, 29(1), 31-53.

Boyd, J.H., Nicoló, G.D. & Jalal, A.M. (2005). *Bank Risk-Taking and Competition Revisited: New Theory and New Evidence.* International Monetary Fund Working Paper No. 06/297, 2007.

Brana, S. & Prat, S. (2016). The effects of global excess liquidity on emerging stock market returns: Evidence from a panel threshold model. *Economic Modelling, 52*, 26-34.

Burki, A.A. & Niazi, G.S.K. (2010). Impact of financial reforms on efficiency of state-owned, private and foreign banks in Pakistan. *Applied Economics*, 42(24), 3147-3160.

Cadavez, V.A. & Henningsen, A. (2012). The use of seemingly unrelated regression to predict the carcass composition of lambs. *Meat Science*, 92(4), 548-553.

Cevik, E.I., Kirci-Cevik, N. & Dibooglu, S. (2016). Global Liquidity and Financial Stress: Evidence from Major Emerging Economies. *Emerging Markets Finance & Trade*, *52*(12), 2790-2807. doi:10.1080/1540496X.2016.1140456

Chen, W. P., Chung, H., Lee, C., & Liao, W. L. (2007). Corporate governance and equity liquidity: Analysis of S&P transparency and disclosure rankings. *Corporate Governance: An International Review*, *15*(4), 644-660.

Chinzara, Z. & Aziakpono, M.J. (2009). Dynamic returns linkages and volatility transmission between South African and world major stock markets. *Studies in Economics and Econometrics*, *33*(3), 69-94.

Chinzara, Z. (2011). Macroeconomic uncertainty and conditional stock market volatility in South Africa. *South African Journal of Economics*, *79*(1), 27-49.

Chiu, C. W. (2014). A macroeconomic investigation of funding liquidity and monetary policy shocks in the United States. *Applied Economics Letters*, *21*(8), 517-521

Chordia, T., Sarkar, A. and Subrahmanyam A. (2005). The Joint dynamics of liquidity, returns and volatility across small and large firms. Working paper UCLA

Claessens, S., Demirgüç-Kunt, A. & Huizinga, H. (2001). How does foreign entry affect domestic banking markets? *Journal of Banking and Finance*, 25(5), 891-911.

Colacito, R, & Croce, M.M. (2010). The Short and Long-Run Benefits of Financial Integration. *American Economic Review*, *100*(2), 527-531. doi: 10.1257/aer.100.2.527

Ćurak, M., Poposki, K. & Pepur, S. (2012). Profitability determinants of the Macedonian banking sector in changing the environment. *Procedia Social and Behavioral Sciences*, 44, 406-416.

Daglish, T., Robertson, O., Tripe, D., & Weill, L. (2015). Translog cost function estimation: Banking efficiency. Working Paper Series 4180, Victoria University of Wellington, *The New Zealand Institute for the Study of Competition and Regulation*. Available at http://ideas.repec.org/vuw/vuwcsr

Das, A. & Ghosh, S. (2009). Financial deregulation and profit efficiency: A non-parametric analysis of Indian banks. *Journal of Economics and Business*, 61(6), 509-528.

Demirgüç-Kunt, A. & Huizinga, A. (1998). Determinants of Commercial Bank Interest Margins and Profitability: Some International Evidence. *World Bank Economic Review* 13, 379-408.

Demirgüç-Kunt, A. & Huizinga, H. (1999). Determinants of commercial bank interest margins and profitability: Some international evidence. *The World Bank Economic Review*, *13*(2), 379-408.

Demirgüç-Kunt, A., Laeven, L. & Levine, R. (2004). Regulations, Market Structure, Institutions and the Cost of Financial Intermediation, *Journal of Money, Credit and Banking*, *36*(3), 593-622.

Demirgüç-Kunt, A., Levine, R. & Min, H.G. (1998). *Opening to Foreign Banks: Issues of Stability, Efficiency & Growth.* Proceedings of the Bank of Korea Conference on the Implications of Globalization of World Financial Markets, Central Bank of Korea, Seoul, Korea.

Dietsch, M. (1993). Economies of scale and scope in French commercial banking industry. *The Journal of Productivity Analysis*, 4, 35-50

Dolde, W., Giaccotto, C., Mishra, D.R., and O'Brien TJ. (2011). Foreign exchange exposure and cost of equity for US companies: Local versus global CAPM. *Journal of Applied Finance* 21 (1)

Doman, M. & Doman, R. (2013). Dynamic linkages between stock markets: The effects of crises and globalization. *Portuguese Economic Journal*, *12*(2), 87-112.

Donadelli, M. (2013). Global integration and emerging stock market excess returns. *Macroeconomics and Finance in Emerging Market Economies*, *6*(2), 244-279

Dorothea, S., & Oleksandr, T. (2007). *The Impact of Foreign Banks Entry on Domestic Banks' Profitability in a Transition Economy* (No. 74). DIW Berlin, discussion paper.

Drechsler, I., Savov, A., & Schnabl, P. (2018). Liquidity, risk premia, and the financial transmission of monetary policy. *Annual Review of Financial Economics*, *10*, 309-328

Edirisuriya, P. & O'Brien, G.C. (2001). Financial deregulation and economies of scale and scope: Evidence from the major Australian banks. *Asia-Pacific Financial Markets*, 8(3), 197-214.

El Khoury, R. (2015). Liquidity in Lebanese commercial banks and its determinants. *Academy of Accounting and Financial Studies Journal*, *19*(3), 57-74.

Erasmus, C., & Makina, D. (2014). An Empirical study of bank efficiency in South Africa using the standard and alternative approaches to Data Envelopment Analysis (DEA). *Journal of economic and behavioural studies.* 6(4), 310-317.

Esterhuysen, J., Vuuren, G.V. & Styger, P. (2012). Liquidity Creation in South African Banks Under Stressed Economic Conditions. *South African Journal of Economics*, *80*(1), 106-122. doi:10.1111/j.1813-6982201101286.x

Fama, E.F. & French, K.R., (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, *33*(1), 3-56.

Flamini, V., McDonald, C. & Schumacher, L. (2009). *The Determinants of Commercial Bank Profitability in Sub-Saharan Africa*. *WP/09/15*. Available from: http://www.imf.org/external/pubs/ft/wp/2009/wp0915.pdf. (Accessed: 30 June 2017).

Fujii, H., Managi, S. & Matousek, R. (2014). Indian bank efficiency and productivity changes with undesirable outputs: A disaggregated approach. *Journal of Banking and Finance*, 38, 41-50.

Fukuyama, H. & Matousek, R. (2011). Efficiency of Turkish banking: Two-stage network system. Variable returns to scale model. *Journal of International Financial Markets, Institutions and Money*, 21(1), 75-91.

Gafrej, O. & Abbes, M.B. (2017). Liquidity Determinants of Islamic and Conventional Banks. *Journal of Islamic Banking & Finance*, *34*(2), 44-61.

Gazioglu, S., (2008). Stock market returns in an emerging financial market: Turkish case study. *Applied Economics*, *40*(11), 1363-1372.

Goyenko, R.Y., & Ukhov, A.D. (2009). Stock and bond market liquidity: A long-run empirical analysis. *Journal of Financial and Quantitative Analysis*, 44(1), pp. 189-212

Greene W.H., & Christensen, L.R. (1976) Economies of Scale in US electric power generation. *Journal of Political Economy*, 84 (4 part 1), 655-676.

Greene, W.H. (2005). Reconsidering heterogeneity in panel data estimators of the stochastic model. *Journal of Econometrics*, 126(2), 269-303

Gupta, R. & Modise, M. P. (2013). Macroeconomic Variables and South African Return Predictability. *Economic Modelling*, 30, 612-622.

Hall, M.J. and Simper, R. (2013). *Efficiency and Competition in Korean Banking*. Nottingham University Business School Research Paper (2012-07).

Hakim, S.A., Hamid, Z. & Meera, A.K.M. (2015). Combining local and global markets in asset pricing in emerging markets: Evidence from three BRICS nations. *The Journal of Developing Areas*, *49*(3), 365-378.

Havrylchyk, O. (2006). Efficiency of the Polish banking industry: Foreign versus domestic banks. *Journal of Banking and Finance*, 30(7), 1975-1996.

Huang, R. D., & Stoll, H. R. (2001). Exchange rates and firms' liquidity: evidence from ADRs. *Journal of International Money and Finance*, *20*(3), 297-325.

Inekwe, J. N., Jin, Y., & Valenzuela, M. R. (2018). Global financial network and liquidity risk. *Australian Journal of Management*, *43*(4), 593-613.

Janek, U. (2004). Effects of foreign banks entry on bank performance in the CEE countries. *University of Tartu Faculty of Economics and Business Administration Working Paper*, (33-2004).

Jeon, B.N., Olivero, M.P. & Wu, J. (2011). Do foreign banks increase competition? Evidence from emerging Asian and Latin American banking markets. *Journal of Banking and Finance, 35*(4), *856*-875.

Jeon, Y. & Miller, S.M. (2005). Performance of domestic and foreign banks: The case of Korea and the Asian financial crisis. *Global Economic Review*, *34*(2), 145-165.

Jinjarak., Y. (2014). Equity prices and financial globalization. *International Review of Financial Analysis,* 33, 49–57

Johann, T., Scharnowski, S., Theissen, E., Westheide, C., & Zimmermann, L. (2019). Liquidity in the German stock market. *Schmalenbach Business Review*, *71*(4), 443-473.

Kasman, A. (2005). Efficiency and scale economies in transition economies: Evidence from Poland and the Czech Republic. *Emerging Markets Finance and Trade*, 41(2), 60-81.

Kašparovská, V., Laštůvková, J. & Střelec, L. (2016). Is the exchange rate a factor of bank liquidity changes? Study of the Czech Republic. *Society & Economy*, *38*(3), 359-374. doi: 10.1556/204.2016.38.3.5

Kassim, S.H. & Manap, T.A.A. (2012). Responses to Interest Rate Changes: A Comparison between Domestic and Foreign Commercial Banks in Malaysia. *Malaysian Journal of Economic Studies*, *49*(1), 21.

Keeley, M.C.(1990). Deposit Insurance, Risk, and Market Power in Banking. *American Economic Review*, 80(5), 1183–200.

Kenani, J.M., Purnomo, J. & Maoni, F. (2013). The impact of the global financial crisis on the integration of the Chinese and Indonesian stock markets. *International Journal of Economics and Finance*, *5*(9), 69.

Kim, H.E. & Lee, B.Y. (2004). *The effects of foreign bank entry on the performance of private domestic banks in Korea.* CGFS (2004). Available from: http://www.bis.org/publ/cgfs22cbpapers.htm. (Accessed: 12 April 2017).

Kim, J. (2018). Bank competition and financial stability: Liquidity risk perspective. *Contemporary Economic Policy*, *36*(2), 337-362.

Kosmidou, K., Pasiouras, F., Zopounidis, C. & Doumpos, M. (2006). A multivariate analysis of the financial characteristics of foreign and domestic banks in the UK. *Omega*, 34(2), 189-195.

Kumbhakar, S.C., Lozana-Vivas, A., Lovell, C.A.K., Hasan, I. (2001). The effects of deregulation on the performance of financial institutions: The case of Spanish savings banks. Journal of Money, Credit, and Banking 33, 101–121.

Kumbirai, M. & Webb, R. (2010). A financial ratio analysis of commercial bank performance in South Africa. *African Review of Economics and Finance*, *2*(1), 30-53.

Laurine, C. (2013). Zimbabwean Commercial Banks Liquidity Risk Determinants after Dollarisation. *Journal of Applied Finance and Banking*, *3*(6), 97-114.

Lee, C.C., Hsieh, M.F. & Dai, H.W. (2012). How does foreign bank ownership in the banking sector affect domestic bank behaviour? A dynamic panel data analysis. *Bulletin of Economic Research*, 64, 86-108.

Lensink, R. & Naaborg, I. (2007). Does foreign ownership foster bank performance? *Applied Financial Economics*, 17(11), 881-885.

Lesmond, D. A. (2005). Liquidity of emerging markets. *Journal of financial economics*, *77*(2), 411-452.

Li, W., Lu, X., Ren, Y., & Zhou, Y. (2018). Dynamic relationship between RMB exchange rate index and stock market liquidity: A new perspective based on MF-DCCA. *Physica A: Statistical Mechanics and its Applications*, *508*, 726-739.

Lin, K.L., Doan, A.T. & Doong, S.C. (2016). Changes in ownership structure and bank efficiency in Asian developing countries: The role of financial freedom. *International Review of Economics and Finance*, 43, 19-34.

Lin, X. & Zhang, Y. (2009). Bank ownership reform and bank performance in China. *Journal of Banking and Finance*, 33(1), 20-29.

Liu, C., Zhang, C., & Zhou, Z. (2018). From funding liquidity to market liquidity: Evidence from the index options market. *Journal of Futures Markets*, *38*(10), 1189-1205

Loncan, T.R. & Caldeira, J.F. (2015). Foreign portfolio capital flows and stock returns: A study of Brazilian listed firms. *Estudos Econômicos (São Paulo)*, *45*(4), 859-895.

Luo, Y., Tanna, S., & De Vita, G. (2016). Financial openness, risk and bank efficiency: Cross-Country evidence. *Journal of Financial Stability*, *24*, 132-148.

Khan, M. S., Scheule, H., & Wu, E. (2017). Funding liquidity and bank risk taking. *Journal of Banking & Finance*, *82*, 203-216.

Maredza, A. & Ikhede, S. (2013). Measuring the impact of the global financial crisis on efficiency and productivity of the banking system in South Africa. *Mediterranean Journal of Social Sciences*, *4*(6), 553.

Maredza, A. (2014). Internal determinants of bank profitability in South Africa: Does bank efficiency matter? *The International Business and Economics Research Journal*, *13*(5), 1033.

Maudos, J. & Solís, L. (2009). The determinants of net interest income in the Mexican banking system: An integrated model. *Journal of Banking and Finance*, 33(10), 1920-1931.

Meeusen, W. and Van Den Broeck J. (1977). Efficiency estimation from Cobb-Douglas production functions with composed errors. *International Economic Review, 1(18), 435-444.*

Merton, R. C. (1973). An intertemporal capital asset pricing model. *Econometrica*, *41*(5), 867-887.

Mertens, A., & Urga, G. (2001). Efficiency, scale and scope economies in the Ukrainian banking sector in 1998. *Emerging Markets Review*, *2*(3), 292-308.

Mlambo, K. & Ncube, M. (2011). Competition and efficiency in the banking sector in South Africa. *African Development Review*, *23*(1), 4-15.

Molyneux, P. & Thornton, J. (1992). Determinants of European Bank Profitability: A Note. *Journal of Banking and Finance*, *16*(6), 1173-1178.

Molyneux, P., & Forbes, W. (1995). Market structure and performance in European banking. *Applied Economics*, *27*(2), 155-159.

Morana, C. (2008). International stock markets co-movements: the role of economic and financial integration. *Empirical Economics*, *35*(2), 333-359.

Ncube, M. (2009). Efficiency of banking sector in South Africa, *African Economic Conference 2009* Fostering Development in an Era of Financial and Economic Crises, Addis Ababa.

Nielsen, L. (2013). How to classify countries based on their level of development. *Social Indicators Research*, *114*(3), 1087-1107.

O'Donnell, C.J. and van der Westhuizen, G. (2002). Regional comparisons of banking performance in South Africa. *The South African Journal of Economics* 70 (3), pp 485-518.

Okeahalam, C. (2006). *Structure and Conduct in the Commercial Banking Sector of South Africa*. Proceedings of the TIPS 2001 Annual Forum.

Okuda, H. & Rungsomboon, S. (2007). The effects of foreign bank entry on the Thai banking market: Empirical analysis from 1990 to 2002. *Review of Pacific Basin Financial Markets and Policies*, *10*(1), 101-126.

Olson, D. & Zoubi, T.A. (2011). Efficiency and bank profitability in MENA countries. *Emerging Markets Review*, 12(2), 94-110.

Pasiouras, F. and Kosmidou, K. (2007). Factors influencing the profitability of domestic and foreign commercial banks in the European Union. *Research in International Business and Finance*, *21*(2), 222-237.

Pástor, Ľ., and Stambaugh, R. F. (2003). Liquidity risk and expected stock returns. *Journal of Political economy*, 111(3), 642-685

Patora, K. (2013). Bank Liquidity Determinants in CEE Countries. *Research Papers of the Wrocław University of Economics / Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu*, *316*, 133-144.

Perera, S., Skully, M., & Chaudhry, Z. (2013). Determinants of commercial bank profitability: South Asian evidence. *Asian Journal of Finance & Accounting*, *5*(1), 365.

Perold, A. F. (2004). The capital asset pricing model. *Journal of economic perspectives*, *18*(3), 3-24.

Phiri, A. (2017). Long-run equilibrium adjustment between inflation and stock market returns in South Africa: A nonlinear perspective. *International Journal of Sustainable Economy*, *9*(1), 19-33.

Piesse, J. & Hearn, B. (2005). Regional integration of equity markets in Sub-Saharan Africa. *South African Journal of Economics*, *73*(1), 36-52.

Ramadan, I.Z., Kilani, Q.A. & Kaddumi, T.A. (2011). Determinants of bank profitability: Evidence from Jordan. *International Journal of Academic Research, 3*(4), 180-191.

Rivard, R. J., & Thomas, C. R. (1997). The effect of interstate banking on large bank holding company profitability and risk. *Journal of Economics and Business*, *49*(1), 61-76.

Ross, S.A. (1976). The arbitrage theory of capital asset. *Journal of Economic Theory,* 13(3), 341-360

Sabi, M. (1996). Comparative analysis of foreign and domestic bank operations in Hungary. *Journal of Comparative Economics*, *22*(2), 179-188.

Sharpe, W.F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, *19*(3), 425-442.

Shieh, H. S. (2012). Does cost efficiency lead to better financial performance? A study on Taiwan international tourist hotels. *The Journal of Hospitality Financial Management*, *20*(1), 17-30.

Shiller, R., & Beltratti, A.E. (1992). Stock prices and bond yields: Can their co-movements be explained in terms of present value models? *Journal of Monetary Economics*, *30*(1), 25-46.

Sidhu, M. K. and Kaur, P. (2019) 'Effect of corporate governance on stock market liquidity: empirical evidence from Indian companies', *Decision (0304-0941)*, 46(3), pp. 197–218

Silva, T.C., Guerra, S.M., Tabak, B.M. & de Castro Miranda, R.C. (2016). Financial networks, bank efficiency and risk-taking. *Journal of Financial Stability,* 25, 247-257.

Solnik, B., & Zuo, L. (2012). A global equilibrium asset pricing model with home preference. *Management Science*, *58*(2), 273-292.

Solnik, B.H. (1974). An equilibrium model of the international capital market. *Journal of Economic Theory*, *8*(4), 500-524.

Stulz, R.M. (1984). Pricing capital assets in an international setting: An introduction. *Journal of International Business Studies*, *15*(3), 55-73.

Sturm, J.E. and Williams, B. (2010). What determines differences in foreign bank efficiency? Australian evidence. *Journal of International Financial Markets, Institutions and Money*, *20*(3), 284-309.

Sturm, J.E. and Williams, B. (2004). Foreign bank entry, deregulation and bank efficiency: lessons for the Australian experience. *Journal of Banking and Finance*, 28(7), 1775–99.

Sufian, F. & Kamarudin, F. (2016). The Impact of Globalization on the Performance of Banks in South Africa. *Review of International Business and Strategy*, 26(4), [s.p.].

Sufian, F. & Noor, M.A.N.M. (2012). Determinants of bank performance in a developing economy: Do bank origins matters? *Global Business Review*, 13(1), 1-23.

Sufian, F. (2012). Determinants of bank profitability in developing economies: Empirical evidence from the South Asian banking sectors. *Contemporary South Asia*, *20*(3), 375-399.

Tarus, D.K., Chekol, Y.B. & Mutwol, M. (2012). Determinants of net interest margins of commercial banks in Kenya: A panel study. *Procedia Economics and Finance*, *2*, 199-208.

Trenca, I., Petria, N., Mutu, S. & Corovei, E. (2012). Evaluating the liquidity determinants in the central and eastern European banking system. *Finance – Challenges of the Future*, *12*(14), 85-90.

Tsai, I.C. (2017). The source of global stock market risk: A viewpoint of economic policy uncertainty. *Economic Modelling*, *60*, 122-131.

Toh, M. Y., Gan, C., & Li, Z. (2019). Revisiting the Impact of Stock Market Liquidity on Bank Liquidity Creation: Evidence from Malaysia. *Emerging Markets Finance and Trade*, *55*(8), 1776-1802.

Uğur, A., & Erkus, H. (2010). Determinants of the net interest margins of banks in Turkey. *Journal of Economic and Social Research*, 12(2), 101.

Umar, M. & Sun, G. (2016). Determinants of different types of bank liquidity: evidence from BRICS countries. *China Finance Review International*, *6*(4), 380-403. doi: 10.1108/CFRI-07-2015-0113

Valverde, S.C. & Fernández, F.R. (2007). The determinants of bank margins in European banking. *Journal of Banking and Finance*, *31*(7), 2043-2063.

Vodova, P. (2011). Liquidity of Czech commercial banks and its determinants. *International Journal of mathematical models and methods in applied sciences*, *5*(6), 1060-1067.

Vodova, P. (2013). Determinants of Commercial Bank Liquidity in Hungary. *Financial Internet Quarterly 'E-Finanse'*, *9*(3), 64-71.

Wezel, T. (2010). *Bank efficiency amid foreign entry: Evidence from the Central American region.* IMF Working Papers, 1-33.

Wolvaardt, P., Wheeler, T. & Scholtz, W. (2010). From Verwoerd to Mandela: South African Diplomats Remember. *Volume 3: Total Onslaught to Normalization*, p. 326.

Xiaogang, C. Skully, M. and Brown, K. (2005). Banking efficiency in China: Application of DEA to pre-and post –deregulation eras: 1993-2000. *China Economic Review*, 16(3), 229-245

Xu, Y. (2011). Towards a more accurate measure of foreign bank entry and its impact on domestic banking performance: The case of China. *Journal of Banking and Finance*, *35*(4), 886-901.

Yin, H., Yang, J. & Mehran, J. (2013). An empirical study of bank efficiency in China after WTO accession. *Global Finance Journal*, *24*(2), 153-170.

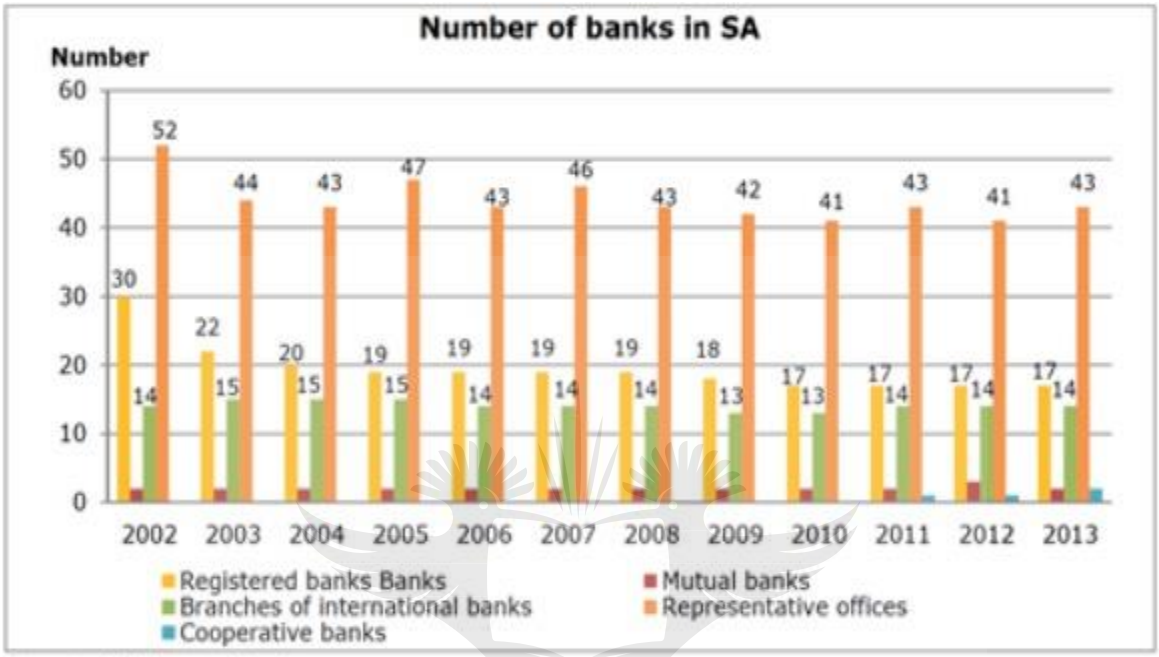
Yin, Y., Zhang, Y., Zhang, X.T. & Hu, F. (2015). Does foreign bank entry make Chinese banks stronger? *Global Economic Review*, 44(3), 269-285.

Zaghdoudi, K., & Hakimi, A. (2017). The determinants of liquidity risk: Evidence from Tunisian banks. *Journal of Applied Finance and Banking*, *7*(2), 71.

Zhang, H., Ye, J., Wei, F., Kashif, R., & Cao, C. (2019). Monetary Policy Adjustment, Corporate Investment, and Stock Liquidity—Empirical Evidence from Chinese Stock Market. *Emerging Markets Finance and Trade*, *55*(13), 3023-3038.

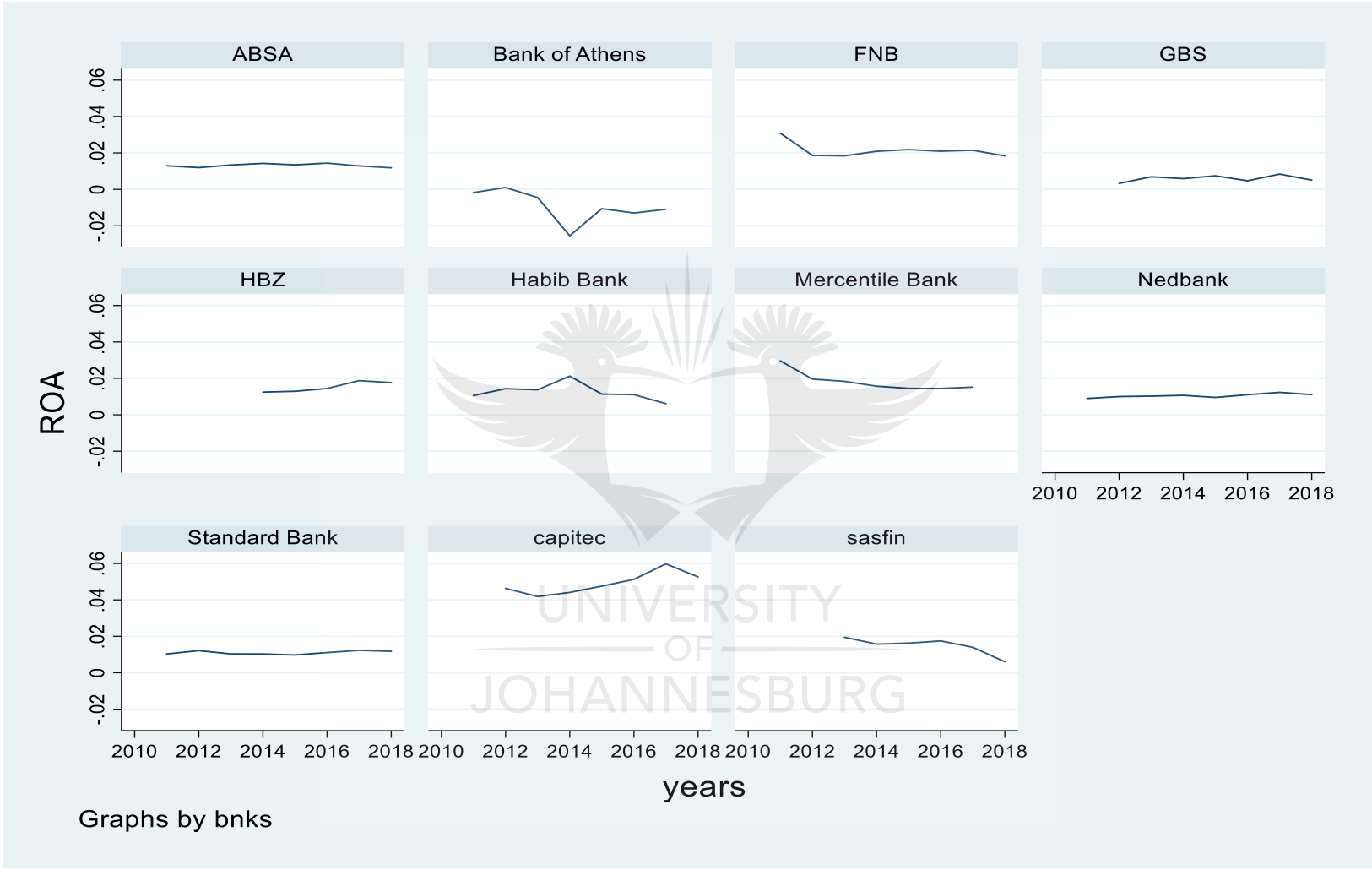
APPENDICES

Appendix 1: Number of Foreign and Domestic Banks in 2013

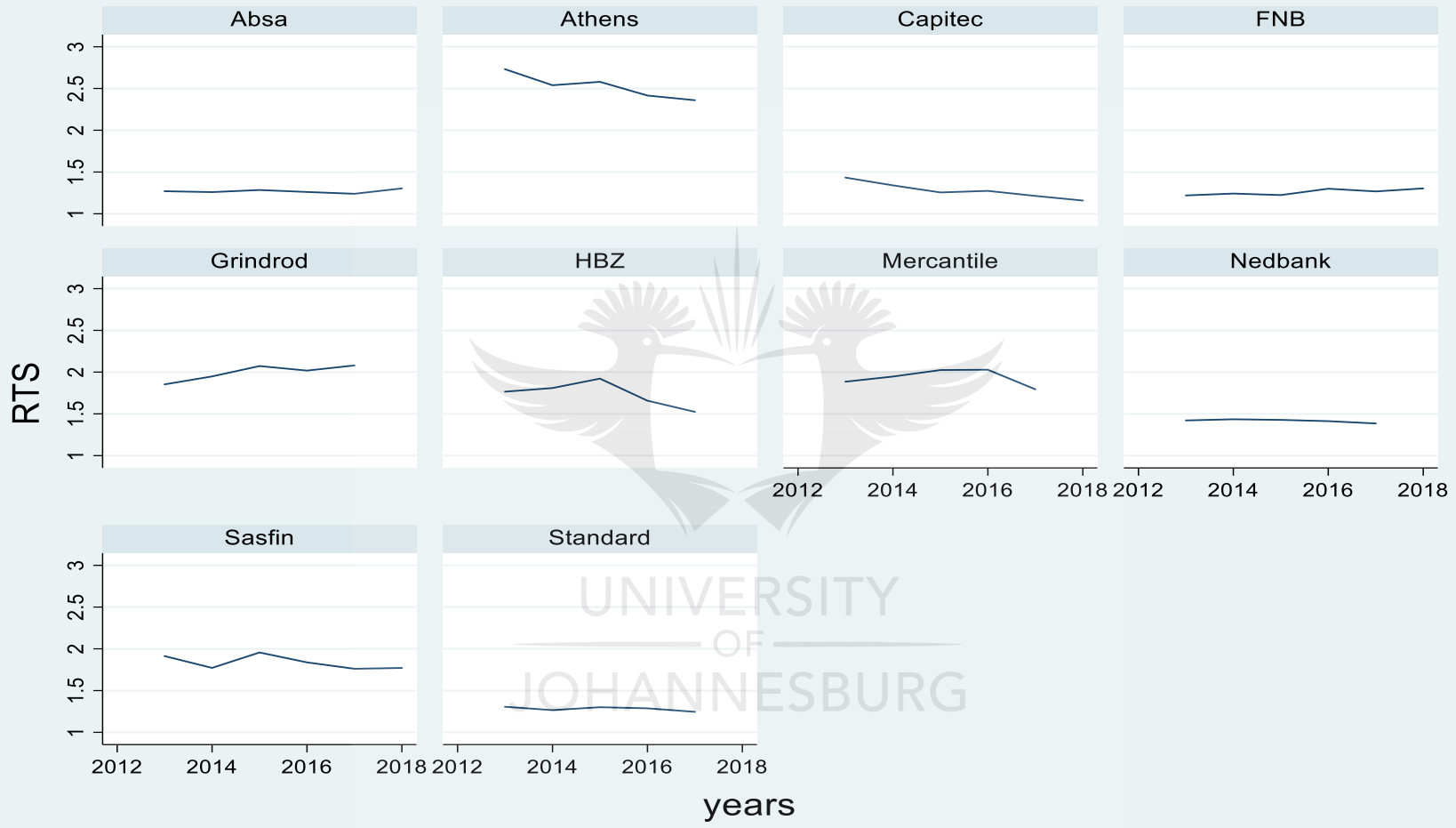


Source: SA Reserve Bank

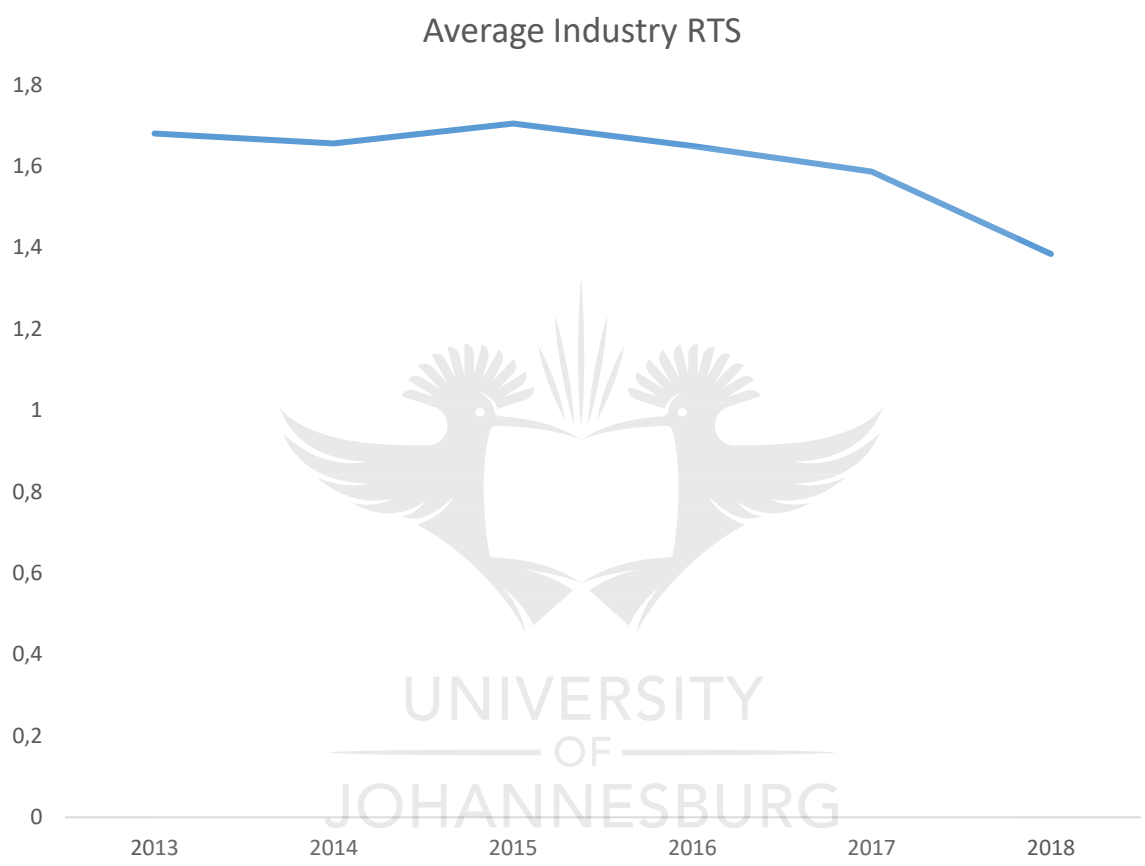
Appendix 2: SA Banks Performance Trend



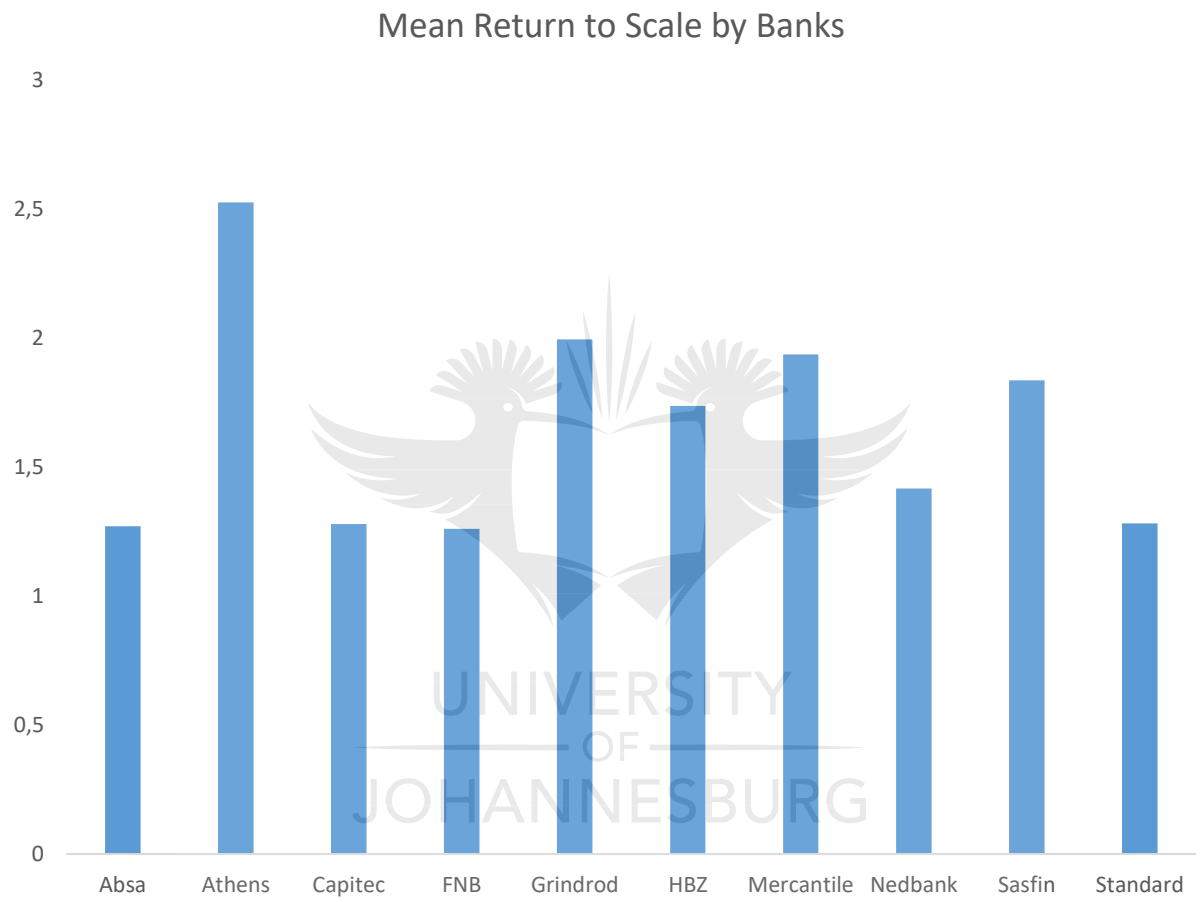
Appendix 3: Trend of Returns to Scales by Banks



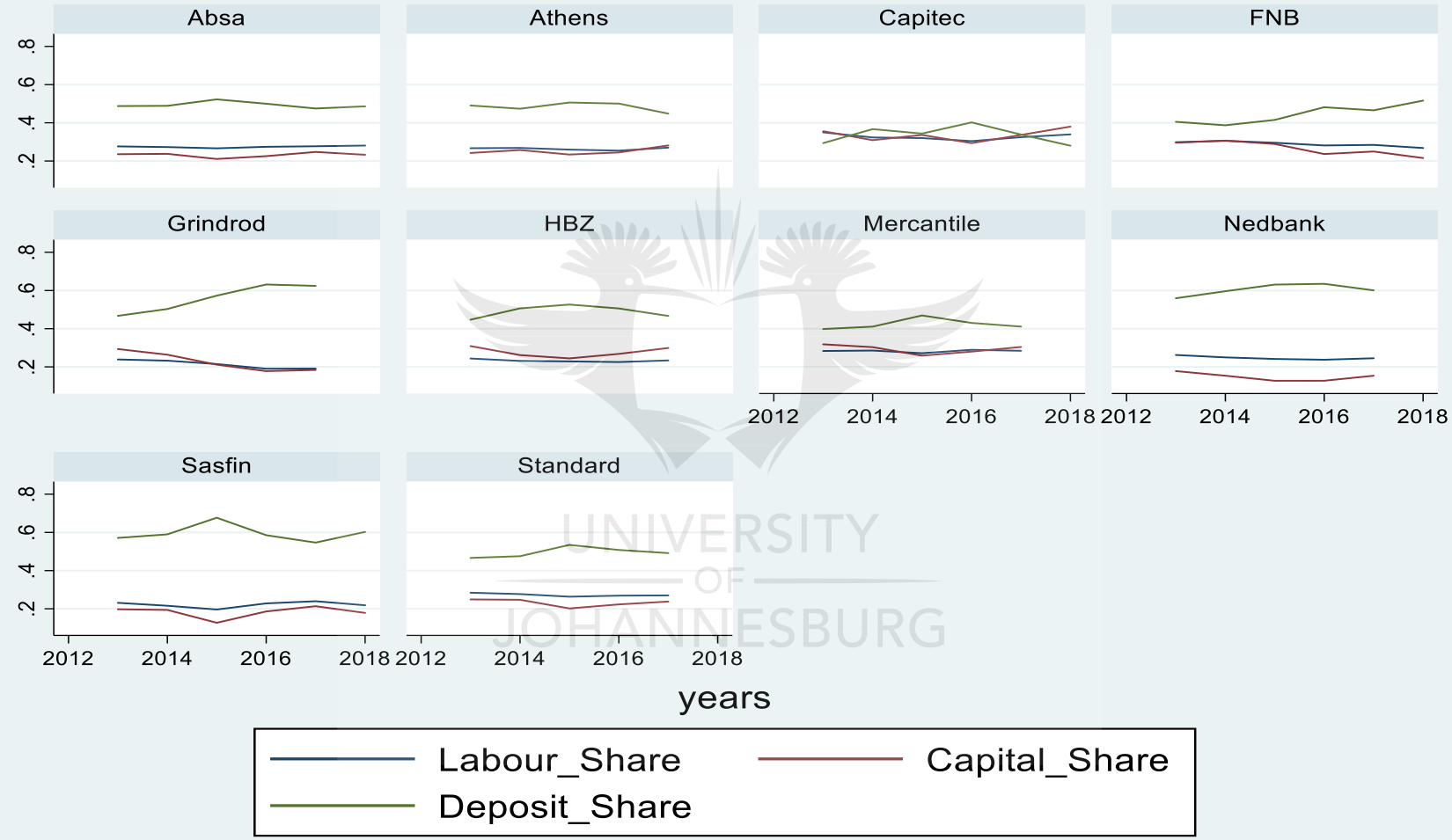
Appendix 4: Bank by Bank Output Comparison



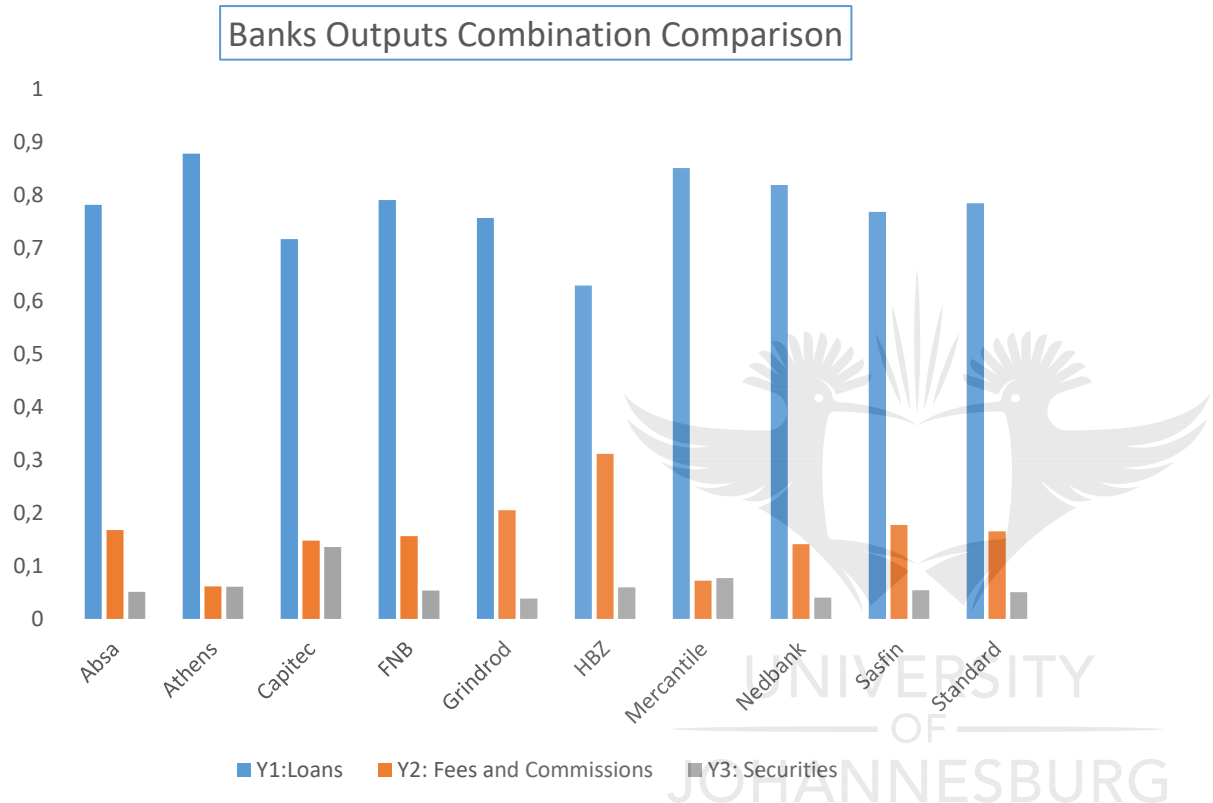
Appendix 5: Mean Return to Scales by Banks



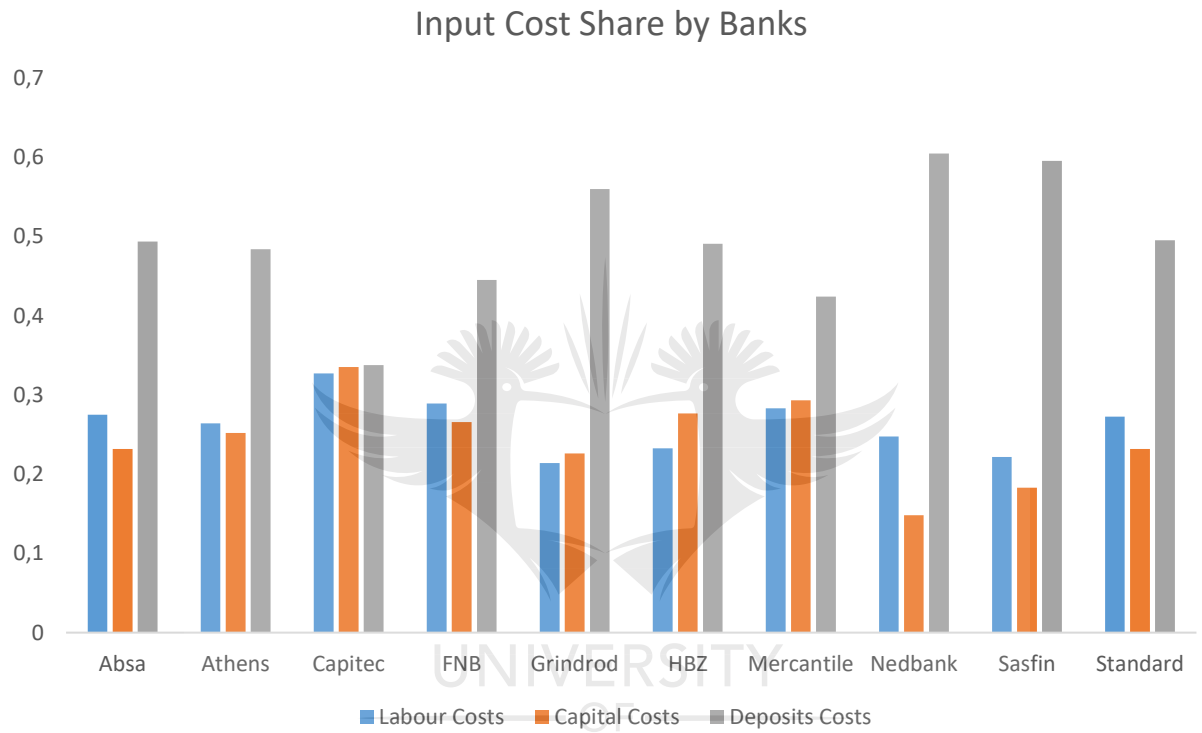
Appendix 6: Bank by Bank Share Factor Contribution



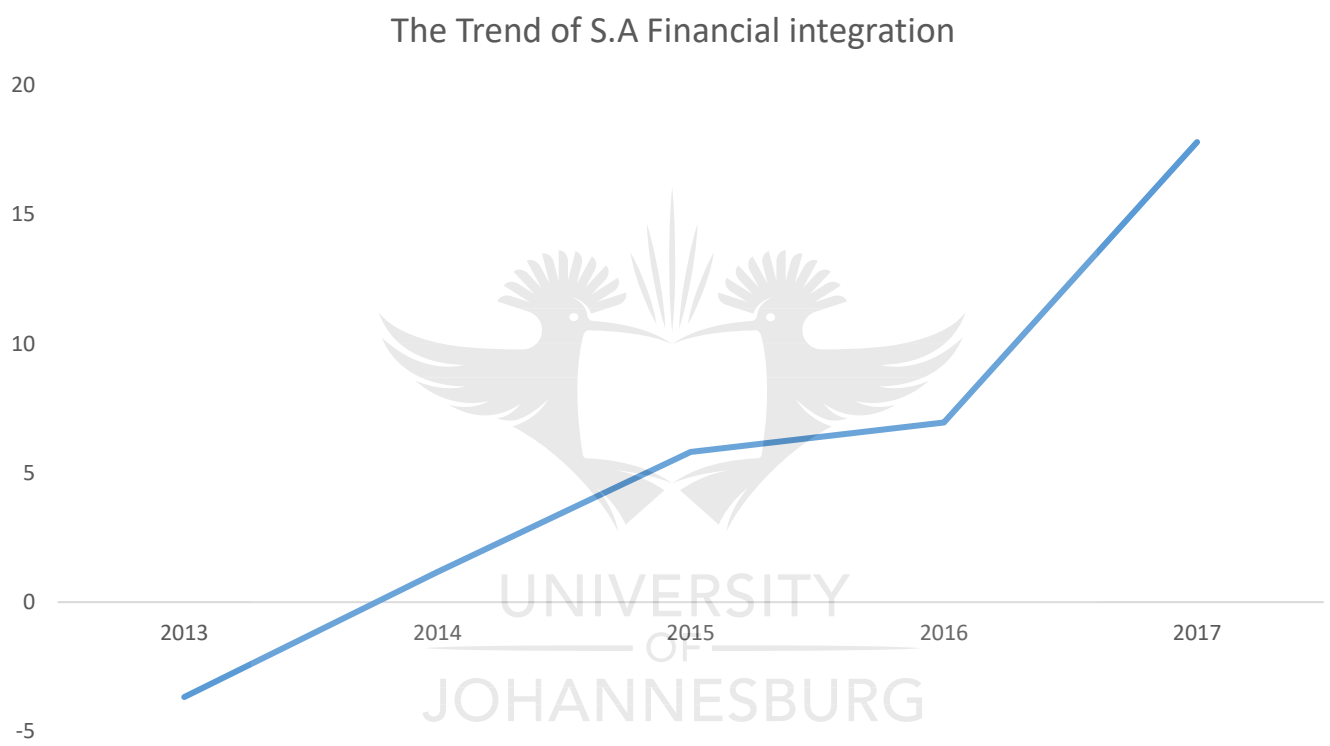
Appendix 7: Bank by Bank Output Comparison



Appendix 8: Input Cost Share by Banks



Appendix 9: The Trend of South African Integration



Appendix 10: Profitability Analysis Data Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	75	.0137795	.013953	-.0254791	.0598017
HHIdep	88	.1805189	.0091002	.164897	.193561
Taxation	68	.2507904	.0629949	.0339523	.3891678
Size	75	14.66281	2.695787	11.26729	18.56302
creditrisk	50	1.55e+07	1.73e+07	108398	4.70e+07
Liquidity Risk	75	61.09764	16.22521	24.393	85.89
Dumm	88	.5454545	.5007831	0	1
lngdp1	88	15.17543	.1599185	14.92198	15.3994
lncpi1	88	4.49791	.1240451	4.306764	4.680278
Marketrates	88	7.35125	.8606264	6.36	8.47

Appendix 11: Profitability Analysis Variables Correlation Matrix

	ROA	HHIdep	Taxation	Size	Credit Risk	Liquidity Risk	Ownership	Lngdp	Infl	Markerates
ROA	1.0000									
HHIdep	-0.0199	1.0000								
Taxation	-0.0740	0.0296	1.0000							
Size	-0.2846	0.1219	-0.0144	1.0000						
Credit Risk	-0.4843	0.1018	-0.0110	0.9317	1.0000					
Liquidity risk	-0.0696	0.2413	-0.0302	0.3890	0.2342	1.0000				
Ownership	0.2471	0.0932	-0.0356	0.3763	0.1132	0.2451	1.0000			
LNGDP	-0.0749	0.4919	0.0819	0.1914	0.1993	0.3731	-0.0012	1.0000		
INF	-0.0761	0.4908	0.0758	0.1950	0.2041	0.3749	0.0012	0.9992	1.0000	
Marketrates	-0.0612	0.6882	0.0814	0.2089	0.2181	0.3695	0.0458	0.9060	0.9127	1.0000

Appendix 12: Foreign and Domestic bank's ROA Correlation Analysis

	ROA Foreign banks	ROA Domestic Banks
ROA Foreign Banks	1.0000	
ROA Domestic Banks	-0.0348	1.0000

Appendix 13: Efficiency Data Summary

Variable		Mean	Std. Dev.	Min	Max
TC	58	2354316	2753618	0	8071990
PL	55	38.06363	15.91797	13.39406	91.42077
PK	56	3.219705	2.028477	.9505157	8.852035
PD	55	.4924585	.0963787	.3393721	.7232961
Y1	56	2.48e+07	2.84e+07	104558.6	8.04e+07
Y2	56	4978648	5880760	8981.473	1.81e+07
Y3	56	1587636	1777569	8302.604	4734167
Fdummy	60	.6	.4940322	0	1
Fdummy	60	.6	.4940322	0	1
Hhidep	60	.0708589	.0931049	0	.2752533
Hhiloans	56	.1070944	.1217299	.0004711	.3171741
Finint	50	5.611634	7.234554	-3.672855	17.80165

Appendix 14: Efficiency Variables Correlation Analysis

	TC	PL	PK	PD	Y1	Y2	Y3	Fdummy	hhidep	hhiloans	finint
TC	1.0000										
PL	0.2013	1.0000									
PK	-0.7165	0.2011	1.0000								
PD	0.0301	0.5955	0.3602	1.0000							
Y1	0.9874	0.2078	-0.7298	0.0006	1.0000						
Y2	0.9865	0.2160	-0.7073	-0.0225	0.9807	1.0000					
Y3	0.9656	0.2023	-0.7278	-0.1099	0.9789	0.9799	1.0000				
Fdummy	0.2303	0.1618	-0.1446	0.3642	0.2656	0.1996	0.2564	1.0000			
Hhidep	0.9517	0.2253	-0.6732	-0.0430	0.9609	0.9636	0.9719	0.2254	1.0000		
Hhiloans	0.9769	0.1928	-0.7350	-0.0068	0.9946	0.9741	0.9746	0.2676	0.9714	1.0000	
Finint	0.0857	0.0122	0.0500	0.2472	0.0256	0.0791	0.0082	0.0000	-0.0066	0.0000	1.0000

Appendix 15: Risk Premia Model Data Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
SAriskpre	289	-2.576481	12.53998	-34.26757	46.9859
CHriskpremia	289	.7259149	10.17879	-25.84453	39.27744
USpremia	289	.5657733	13.15696	-79.25764	21.18895
Lngdpus	285	30.41856	.0673708	30.30275	30.55802
Lngdpch	290	27.02286	.1385346	26.72866	27.27695
Finint	281	-.0003004	.004445	-.0186431	.0077933
Fincris	290	.2068966	.4057809	0	1

Appendix 16: Risk Premia Model Variables Correlation Analysis

	SAriskpremia	Chriskpremia	USrkpremia	Lngdpus	Lngdpch	finint	fincris
SAriskpremia	1.0000						
Chriskpremia	0.3460	1.0000					
USrkpremia	0.2674	0.5073	1.0000				
Lngdpus	-0.0566	0.0173	0.2568	1.0000			
Lngdpch	0.0213	0.0294	0.3278	0.9136	1.0000		
Finint	0.0643	0.0807	0.0557	0.0668	0.0785	1.0000	
Fincris	-0.2142	-0.0397	-0.0710	-0.3698	-0.3229	-0.0474	1.0000

Appendix 17: Risk Premia Model Variables Description

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
SA_China_Global Beta	245	.5534931	1.133493	-1.961553	5.348451
SA_US_Global Beta	245	-.3585666	1.909501	-8.516497	4.845464
SA_US_Economic Conditions Beta	245	-402.109	681.9191	-3539.629	1343.928
SA_CHINA_Economic Conditions Beta	245	118.46	174.269	-360.4196	739.5826

Appendix 18: Estimated Beta Correlations

	SA_China_Global Market Beta	SA_US_Global Market Beta	SA_CH_Economic conditions Beta	SA_US_Economic conditions Beta
SA_China_Global Market Beta	1.0000			
SA_US_Global Market Beta	-0.9336	1.0000		
SA_CH_Economic conditions Beta	0.5798	-0.5760	1.0000	
SA_US_Economic conditions Beta	-0.0329	0.0644	-0.6066	1.0000

Appendix 19: Liquidity Risk Model Variables Description

	OBS	MEAN	STD.DEV	MIN	MAX
FUNDING LIQUIDITY	188	61.58071	16.86761	13.248	85.89
MARKT LIQUIDITY	196	-116.4086	444.7704	-1515.48	410.81
FININT	182	1.504346	.9755776	.2293106	3.443052
FINCRIS	196	.2142857	.4113767	0	1
MS	196	1782756	578741.4	818740	2806033
CAPADEQ	143	19.33161	10.13354	-12	78.94
HHI	196	.0147194	.0283795	0	.1448891
LNTA	190	10.47428	2.834466	5.836272	14.73577
EURZAREXCH	196	1149.213	263.0154	791.26	1628.47
DOMBUSCYCLE	196	14.83146	.0998497	14.62236	14.95491
INTBUSCYCLE	182	31.44386	.0503557	31.35386	31.53462

Appendix 20: Liquidity Risk Model Variables Correlation Analysis

	FUNDING LIQUIDITY	MARKET LIQUIDITY	FININT	FINCRIS	MS	CAPADEQ	HHI	LNTA	EURZAR EXCH	DOMBUS CYCLE	INTBUS CYCLE
FUNDING LIQUIDITY	1.0000										
MARKET LIQUIDITY	0.0037	1.0000									
FININT	0.1401	-0.0060	1.0000								
FINCRIS	0.1248	-0.2532	0.6939	1.0000							
MS	0.0521	0.3529	-0.0538	-0.2063	1.0000						
CAPADEQ	-0.0227	-0.0995	0.0178	0.0829	-0.1242	1.0000					
HHI	0.3423	-0.0363	0.0223	0.0215	-0.0958	-0.2691	1.0000				
LNTA	0.4790	0.0226	0.0252	-0.0154	0.1172	-0.3133	0.6400	1.0000			
EURZAREXCH	0.0531	0.4734	0.1912	0.0332	0.8944	-0.1163	-0.0789	0.0996	1.0000		
DOMBUSCYCLE	0.0809	0.3089	0.0148	-0.1682	0.9817	-0.1089	-0.0968	0.1227	0.8486	1.0000	
INTBUSCYCLE	0.0331	0.1898	-0.0818	-0.2292	0.9567	-0.1168	-0.0873	0.1255	0.8456	0.9485	1.0000

Appendix: 20: Liquidity Risk SEM Output